

DEPARTMENT OF AGRICULTURE WEIGHTS AND MEASURES



STUDY GUIDE

FOR
STRUCTURAL PEST CONTROL
APPLICATOR EXAMINATIONS

2006

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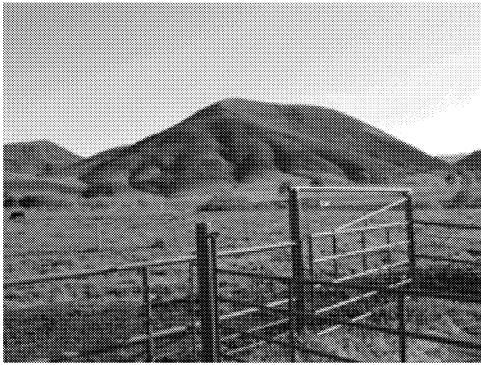
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Pesticide Complaint Line 800-528-9333
Spanish and English
Messages monitored daily

San Luis Obispo County, California

Department Mission Statement



The Department of Agriculture/Weights and Measures is committed to serving the community by protecting agriculture, the environment, and the health and safety of its citizens, and by ensuring equity in the marketplace.

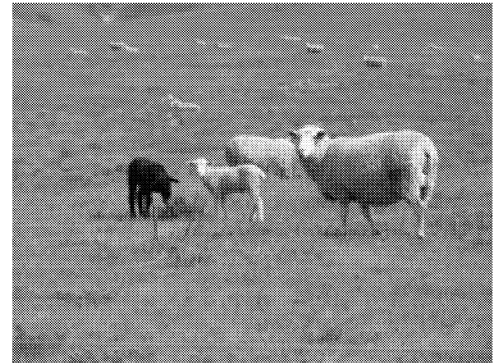


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STUDY MATERIAL AND SCOPE OF EXAMINATION FOR APPLICATOR LICENSE BRANCHES 2 AND 3

The following outlines the scope of the applicator licensing examination, and provides a list of reference material sources available to pest control operators to use in training employees to take the examination to be a pesticide applicator.

PEST LOCATION

Typical harborage areas for structural pests in different life cycle stages

Structural deficiencies and construction practices that invite pest entry and harborage

PREAPPLICATION ASSESSMENT

Common signs of wood-pest infestations and infections

Methods to minimize pesticide exposure to non-target pests and organisms

Effects of pesticides on surfaces

Factors that influence or enhance pesticide effectiveness

State laws pertaining to worker safety in pest control operations

State laws pertaining to handling and storage of pesticides

Contents of wood-destroying pests and organisms inspection reports

Procedures to notify consumers about planned pesticide application

First-aid techniques to treat injuries resulting from pesticide exposure

Methods to handle pesticide explosions and fires

Different types of emergencies resulting from misapplication of pesticides

Contents of major sections of pesticide labels

Types of property damage that could result from pesticide application

Laws pertaining to storage of pesticides during transport

Different types of foundations associated with different types of structures

Chemical control measures for non-termite wood pest infestations

Laws regarding use of personal protective equipment

Techniques to prevent pesticide accidents during application

Techniques to mix volumes of pesticides

Methods for preventing pesticide spills

Procedures for cleaning and maintaining personal protective equipment

TREATMENT METHOD DETERMINATION

Chemical families of pesticides used for structural pest control Level of toxicity to humans of chemical families used for structural pest control

Occupant conditions (e.g., age, health) with potential for increased risk of sensitivity to pesticides

Residues associated with different pesticide formulations on different surfaces

Effects of temperature, rate of dilution, and ventilation on pesticide odors

Mode of action on pests of chemicals used for structural pest control Pesticide formulations suitable for different surfaces and different pests

Procedures for determining the rate of application and pesticide dilution ratios

SITE PREPARATION AND TREATMENT APPLICATION

Manufacturer's label restrictions on treatment application
Equipment for applying liquid pesticides
Methods to repair, maintain, and clean liquid application equipment
Methods to repair, maintain, and clean dry chemical application equipment
Techniques to confine pesticide applications to treatment areas
Methods to clean up and contain pesticide leaks and spills
Prescribed methods for safe disposal of used pesticides and pesticide containers
Laws related to reporting pesticide spills and leaks
Factors that influence compatibility of pesticides combined at time of application
Label contents prescribed by state and federal agencies
Requirements for area preparation for different treatment applications
Types of, and procedures for, use of personal protective equipment
Application of pesticide label information to select pesticides for spot treatment
Types of, and procedures for, use of pesticide application equipment

SAFETY PROCEDURES FOR HANDLING PESTICIDES

Procedures for containing spilled liquid pesticides
Symptoms of oral, dermal, and respiratory overexposure to applied pesticides and materials
Procedures for disposal of absorbent material used to soak up pesticide spills
Procedures for containing and removing spilled dry materials
Procedures for disposal of used pesticide containers
Laws and regulations related to storage, disposal, and transportation of pesticides
Procedures for cleaning and maintenance of application and personal protective equipment
Procedures for preventing malfunctions of application and personal protective equipment
Reference sources for first-aid procedures for overexposure of pesticides to humans or animals
Application of safety precautions on pesticide labels to prevent overexposure of pesticides to self and others

STUDY REFERENCES

The Handbook of Pest Control, 8th Edition, available from: GIE Media, 800/456-0707
Residential, Industrial, and Institutional Pest Control, available from: ANR Publications, 800/994-8849
The Safe and Effective Use of Pesticides, available from: ANR Publications, 800/994-8849
Business and Professions Code, Division 3, Chapter 14, Structural Pest Control Act or www.pestboard.ca.gov
California Code of Regulations, Title 3, Division 6, and Title 16, Division
Department of Pesticide Regulation's Pesticide Safety Information Series N, www.cdpr.ca.gov

Structural Pest Control Board 1418 Howe Ave. Sacramento, Ca. 95825
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www.pestboard.ca.gov

Structural Pest Control

"**Structural pest control**" and "pest control" as used in this chapter are synonymous. Except as provided in Section 8555 and elsewhere in this chapter, it is, with respect to household pests and wood destroying pests or organisms, or other pests which may invade households or other structures, including railroad cars, ships, docks, trucks, airplanes, or the contents thereof, the engaging in, offering to engage in, advertising for, soliciting, or the performance of, any of the following: identification of infestations or infections; the making of an inspection or inspections for the purpose of identifying or attempting to identify infestations or infections of household or other structures by such pests or organisms; the making of inspection reports, recommendations, estimates, and bids, whether oral or written, with respect to such infestations or infections; and the making of contracts, or the submitting of bids for, or the performance of any work including the making of structural repairs or replacements, or the use of insecticides, pesticides, rodenticides, fumigants, or allied chemicals or substances, or mechanical devices for the purpose of eliminating, exterminating, controlling or preventing infestations or infections of such pests, or organisms. "**Household pests**" are defined for the purpose of this chapter as those pests other than wood destroying pests or organisms, which invade households and other structures, including, but not limited to, rodents, vermin and insects.

Control of pests invading structures is strictly structural pest control, whether contained on, within, or outside of the structure. Control for the purposes of eliminating ants or earwigs as garden or orchard pests, or to assist in the control of honeydew-producing insects, is strictly agricultural pest control, even when treatment is applied adjacent to a structure, and incidentally prevents an invasion of the structure.

Any application of a pesticide to plants, irrespective of their location in respect to a structure, is agricultural pest control, except for the incidental contact of foliage or plants with a pesticide arising from structural pest control activities. Pesticide applications made to indoor plants in malls, offices, etc., would be agricultural pest control. Control of fleas, as pests to humans and their pets, in or around a structure, including treatment of lawn areas nearby for fleas, is structural pest control.

Control of pests infesting a structure or its contents, whether by fumigation or other means, is structural pest control. This would include birds infesting structures and control of pests infesting grain or other agricultural products. Where such products are stored or placed within structures, including railroad cars and grain bins, control may lawfully be applied under either type of license.

Removal of live bees from a structure, if done for hire, does not require a structural pest control license. The use of a pesticide to destroy diseased bees in a structure to prevent infection of an apiary can, however, can be construed as agricultural pest control.

Treatment to roofs with a pesticide(s) to control fungi, algae, bacteria, etc., would require a structural pest control license if done for hire.

For the purpose of delimiting the type and character of work authorized by the various branch licenses hereinafter set forth, the practice of pest control is classified into the following branches, namely:

Branch 1. Fumigation. The practice relating to the control of household and wood destroying pests or organisms by fumigation with poisonous or lethal gases.

Branch 2. General pest. The practice relating to the control of household pests, excluding fumigation with poisonous or lethal gases.

Branch 3. Termite. The practice relating to the control of wood destroying pests or organisms by the use of insecticides, or structural repairs and corrections, excluding fumigation with poisonous or lethal gases.

All applicators' licenses shall **expire** at 12:00 midnight **three years** from the date of issue. Every applicator shall pay a fee for the renewal of his or her license. The board shall, on or 60 days prior to the expiration of an applicator's license, mail to the applicator whose license will expire, addressed to him or her at his or her **last known address**, a notice that his or her renewal fee is due and payable and that, if not paid by the due date, a penalty will be added thereto. In no case shall the penalty be waived. Upon the receipt of the fee, the board shall cause the renewal certificate to be issued.

What is a Pesticide?

A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Pests can be insects, mice and other animals, unwanted plants (weeds), fungi, or microorganisms like bacteria and viruses. Though often misunderstood to refer only to insecticides, the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests. Under United States law, a pesticide is also any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. Many household products are pesticides.

Did you know that all of these common products are considered pesticides?

- Cockroach sprays and baits
- Insect repellents for personal use.
- Rat and other rodent poisons.
- Flea and tick spray, powders, and pet collars.
- Kitchen, laundry, and bath disinfectants and sanitizers.
- Products that kill mold and mildew.
- Some lawn and garden products, such as weed killers.
- Some swimming pool chemicals.

By their very nature, most pesticides create some risk of harm to humans, animals, or the environment because they are designed to kill or otherwise adversely affect living organisms. At the same time, pesticides are useful to society because of their ability to kill potential disease-causing organisms and control insects, weeds, and other pests. In the United States, the Office of Pesticide Programs of the Environmental Protection Agency is chiefly responsible for regulating pesticides. Biologically-based pesticides, such as forams and microbial pesticides, are becoming increasingly popular and often are safer than traditional chemical pesticides.

Here are some common kinds of pesticides and their function:

Algaecides Control algae in lakes, canals, swimming pools, water tanks, and other sites.

Antifouling agents Kill or repel organisms that attach to underwater surfaces, such as boat bottoms.

Antimicrobials Kill microorganisms (such as bacteria and viruses).

Attractants Attract pests (for example, to lure an insect or rodent to a trap). (However, food is not considered a pesticide when used as an attractant.)

Biocides Kill microorganisms.

Disinfectants and sanitizers Kill or inactivate disease-producing microorganisms on inanimate objects.

Fungicides Kill fungi (including blights, mildews, molds, and rusts).

Fumigants Produce gases or vapor intended to destroy pests in buildings or soil.

Herbicides Kill weeds and other plants that grow where they are not wanted.

Insecticides Kill insects and other arthropods.

Miticides (also called acaricides) Kill mites that feed on plants and animals.

Microbial pesticides Microorganisms that kill, inhibit, or out compete pests, including insects or other microorganisms.

Molluscicides Kill snails and slugs.

Nematicides Kill nematodes (microscopic, wormlike organisms that feed on plant roots).

Ovicides Kill eggs of insects and mites.

Foramens Biochemicals used to disrupt the mating behavior of insects.

Repellents Repel pests, including insects (such as mosquitoes) and birds.

Rodenticides Control mice and other rodents.

The term pesticide also includes these substances:

Defoliants Cause leaves, or other foliage, to drop from a plant, usually to facilitate harvest.

Desiccants Promote drying of living tissues, such as unwanted plant tops.

Insect growth regulators Disrupt the molting, maturity from pupal stage to adult, or other life processes of insects.

Plant growth regulators Substances (excluding fertilizers or other plant nutrients) that alter the expected growth, flowering, or reproduction rate of plants.

What about pest control devices?

EPA also has a role in regulating devices used to control pests. More specifically, a "device" is any instrument or contrivance (other than a firearm) intended for trapping, destroying, repelling, or mitigating any pest. A mousetrap is an example of a device. Unlike pesticides, EPA does not require devices to be registered with the Agency. Devices are subject to certain labeling, packaging, record keeping, and import/export requirements, however.

What is not a pesticide?

The EPA definition of pesticides is quite broad, but it does have some exclusions:

Drugs used to control diseases of humans or animals (such as livestock and pets) are not considered pesticides; such drugs are regulated by the Food and Drug Administration.

Fertilizers, nutrients, and other substances used to promote plant survival and health are not considered plant growth regulators and thus are not pesticides.

Biological control agents, except for certain microorganisms, are exempted from regulation by EPA. (Biological control agents include beneficial predators such as birds or ladybugs that eat insect pests.)

Products which contain certain low-risk ingredients, such as **garlic and mint oil**, have been exempted from Federal registration requirements, although State regulatory requirements may still apply.

PESTICIDE TOXICITY

Pesticides vary in their toxicity, from only slightly toxic to extremely toxic. Toxicity is the degree to which a substance is harmful or poisonous.

Acute Toxicity of a pesticide refers to the toxic response resulting from a **single dose** of, or exposure to, a pesticide.

Chronic Toxicity is the toxic response resulting from **repeated exposures** to small doses of a pesticide over a longer period of time.

Scientists measure the toxicity of a pesticide by determining its LD50.

Lethal Dose 50% (LD50)

The LD50 value is the statistical estimate of a chemical dose which when administered will kill 50% of the test animals within a stated period of observation (24 hours to seven days). The LD50 value is commonly expressed as milligrams of a substance per kilogram of body weight of the test animal. The test animal is usually a rat, mouse or rabbit. **The larger the value, the less toxic the pesticide.** Pesticides with low values (0-10) are extremely toxic.

Examples:

<u>Pesticide</u>	<u>Acute Oral LD50 (mg/kg)</u>
Methyl Parathion	6
Chlorpyrifos	96-270
2, 4-D	699
Diazinon	1,250
Atrazine	1,780
Malathion	5,500

It may be useful to compare the LD50 of certain pesticides with the LD50 of substances commonly used by people in their homes. The following three compounds have a low acute toxicity in terms of the rating for pesticides, but could cause toxic reactions if consumed in sufficient quantities.

<u>Compound</u>	<u>Oral LD50 (mg/kg)</u>
acetylsalicylic acid (Aspirin)	1,000
sodium chloride (table salt)	3,320
ethylene glycol (antifreeze)	3,460

Acute Oral LD50 is the amount of a substance (mg/kg of body weight) which when ingested orally will kill 50% of the test animals.

Dermal LD50 is the amount of a substance (mg/kg of body weight) which when applied to the skin will kill 50% of the test animals.

Inhalation Toxicity LC50 is the concentration (expressed in parts per million) of a substance in air which will kill 50% of the test animals over a predetermined period of time.

HAZARD AND RISK

The "hazard" and "risk" of pesticides should be of concern to users. A hazard is the danger of exposure to the pesticide. Risk is the magnitude of harm resulting from exposure and the possibility of it occurring.

$$\text{RISK} = \text{TOXICITY} \times \text{EXPOSURE}$$

A highly toxic pesticide can be used without causing a harmful effect if it is handled with care and with caution. Exposure to pesticides can be minimized by wearing protective clothing and equipment, and by learning how to handle pesticides carefully. If the exposure to the pesticide is low or even nil, then the risk is reduced, even when handling highly toxic pesticides.

ROUTES OF ABSORPTION OF PESTICIDES

Oral refers to the intake of a substance by the mouth and digestive tract. Poisoning may result from accidental ingestion, ingestion for suicidal reasons or contamination of foodstuffs. It is commonly due to carelessness, example blowing out of sprayer nozzles, smoking or eating prior to washing the hands. The **most common occurrence of an oral intake** is when pesticides have been removed from their original containers and stored in liquor, soft drink or food bottles.

Dermal is the intake of a substance through contact with exposed skin. It can occur easily through direct contact with the spray concentrate, spray solution or spray mist during spraying or through the wearing of contaminated clothing. Absorption depends on several conditions. Skin rashes, broken skin or abrasions may increase the rate of absorption. There is less absorption of powders than liquids. Oil solutions may be more readily absorbed than aqueous solutions. Fortunately intact skin is a very effective barrier against any substances. **Dermal absorption** is the **most common route of poisoning** from the exposure to pesticides.

Inhalation is the absorption of airborne particles of a substance. It occurs when mixing and spraying and is increased when working in confined or poorly ventilated areas. The chemical must be airborne to cause toxicity and this is achieved by the production of small spray particles, gases or vapors. The nose and throat are very effective barriers and only very small particles can reach the lung. The surface of the lung is a very fine membrane which is a poor barrier against the entry of chemicals. The membrane may also be damaged by some chemical reducing its effectiveness.

TYPES OF CHRONIC TOXICITY

It is not possible to assess chronic toxicity of a pesticide in the same way as an LD50 or LC50 is used to determine acute toxicity. Instead, a number of different tests are performed on animals which help to predict whether a pesticide will cause a number of possible long-term effects. Test animals are exposed to sub lethal levels of pesticides for periods ranging from about 90 days to several years. They are examined for a wide variety of toxic effects from dermal, oral and respiratory exposure.

Such effects include:

Mutagenicity is a mutation or genetic change in a cell. It may occur in the germ cell (sperm or

ovum) of a parent, in the cell formed by the union of sperm and ovum from which the fetus develops or in some cell(s) of the fetus after development has begun.

Carcinogenicity is the production of cancer, i.e., new or abnormal growth such as a tumor. All chemicals which produce cancer are carcinogens.

Teratogenicity is the production of abnormalities (malformation in developing organisms such as the fetus). Thalidomide is one of the better-known teratogens.

SYMPTOMS OF PESTICIDE POISONING

MILD - dizziness, profuse sweating, excessive salivation, throwing up

MODERATE - muscle pain or cramps, constricted pupils

SERIOUS - Difficulty Breathing

Pesticide Label

By law, certain kinds of information must appear on a pesticide label. People who use pesticides have the **LEGAL** responsibility to read, understand and follow the label directions. Pest problems occur in many different settings from agricultural to commercial and residential. Many times a pesticide will be chosen as part of the management plan for the problem. If you choose to apply a pesticide, understanding the contents of the pesticide label is essential for the product's safe and effective use.

The information on the pesticide label represents the research, development and registration procedures that a pesticide must undergo before reaching the market. The pesticide use information obtained in this process is referred to as the label or labeling, two similar words but with different meanings.

The label is the information printed on or attached to the pesticide container; it has several interpretations. To the manufacturer, the label is a "license to sell." To the state or federal government, the label is a way to control the distribution, storage, sale, use and disposal of the product. To the buyer or user, the label is the main source of information on how to use the product correctly, legally and safely.

Labeling refers to all the information that you might receive from the company or its sales representative about the product. This includes brochures, flyers and other information accompanying the pesticide product.

Familiarity with the pesticide label is crucial to selecting the most appropriate pesticide products for your use and therefore receiving maximum benefit from their use. While the label may seem overwhelming at first, it takes only a few minutes to understand the information once the general format is recognized.

You should read the pesticide label:

- Before purchasing the pesticide to ensure that it is the one you need.
- Before mixing the pesticide to ensure the proper pesticide concentration.
- Before applying the pesticide to ensure proper use.
- Before storing of excess chemical or disposal of the empty container.

Information contained on most labels can be divided into four major categories: **SAFETY**, **ENVIRONMENTAL**, **PRODUCT** and **USE INFORMATION**. This guide discusses the contents of these categories and provides interpretations.

Safety information

1. Child hazard warning. The front panel of every pesticide label must bear the statement, **"KEEP OUT OF REACH OF CHILDREN."** Poisoning is a major cause of injuries to children.

2. Signal word. A signal word is displayed in large letters on the front of the label to indicate approximately how acutely toxic the pesticide is to humans. The signal word is based on the entire contents of the product, not the active ingredient alone. The signal word does not indicate the risk of delayed or allergic effects. All highly toxic pesticides that are very likely to cause **acute illness** through oral, dermal, or inhalation exposure have **DANGER** as their signal word and will carry the word **POISON** printed in red with the **skull-and-crossbones** symbol. These pesticides may have cause death if ingested orally. Products that have the DANGER signal word due to skin and eye irritation potential will not carry the word POISON or the skull-and-crossbones symbol.

Signal word	Toxicity's	Approx. amount needed to kill the average person
DANGER (I)	Highly toxic	A taste to a teaspoon
WARNING (II)	Moderately toxic	A teaspoon to a tablespoon
CAUTION (III)	Slightly toxic	An ounce to more than a pint

Minimal Exposure Pesticides (MEP) are pesticides with hazards not identified by the signal word system. If you exposed to these pesticides, you may not notice any effect for a long time after the exposure.

3. Statement of practical treatment. The labels for all highly toxic pesticides (signal word DANGER) must provide information to medical personnel should a poisoning occur. Some examples: "If swallowed, call a physician or poison control center immediately"; "if on skin, wash skin with soap and water." It is in this section that proper **antidotes** and treatment are recommended for medical personnel treating a victim. For this reason, always take the pesticide label with you if you need to visit an emergency medical facility. Products labeled DANGER also bear an 800 telephone number that physicians may call for further treatment advice. Often labels for less toxic pesticides will also provide first-aid instructions.

4. Hazards to humans and domestic animals. This part of the label includes **precautionary statements** indicating specific hazards, routes of exposure and precautions to be taken to avoid human and animal injury. The label will contain statements that indicate which route of entry (mouth, skin, eyes, lungs) you must particularly protect and what specific action you need to take to avoid acute effects from exposure to the pesticide. You will see such statements as "fatal if absorbed through the skin, fatal if swallowed, and poisonous if inhaled. Do not breathe vapors or spray mist. Do not get on skin or clothing." Pesticides that have the potential to cause delayed effects must have label statements warning of that fact. These statements will tell you whether the product has been shown to cause problems such as tumors or reproductive problems in laboratory animals. Additional information in this section will alert you if the product has the potential to cause allergic effects, such as skin irritation or asthma. Sometimes the labeling refers to allergic effects as "sensitization."

5. Personal protective equipment. Most pesticide labels contain specific instructions concerning the type of clothing that must be worn during the handling and mixing processes. This information is usually found following the statements regarding acute, delayed and allergic

effects. Some labels may list this information after the signal word. An example of some common statements from pesticide labels regarding personal protective equipment is shown in the text box. The personal protective equipment listed is the minimum protection that should be worn while handling the pesticide. Sometimes the statements will require different personal protective equipment for different pesticide handling activities. In some cases, less personal protective equipment is allowed when you will be applying the pesticide in safer situations, such as enclosed cabs.

6. Environmental hazards. This section of the label explains the nature of potential hazards and the precautions needed to prevent injury or damage to nontarget organisms or to the environment. Some general statements appear on practically every pesticide label; for example, most pesticide labels will warn you not to contaminate water when you apply the pesticide or when you clean your equipment or dispose of pesticide wastes. It is also in this section where information can be found if the product poses a threat to groundwater. Instructions will be provided to minimize such impacts. Some labels will mention endangered species concerns in this section.

7. Use classification. EPA is required to classify pesticides for either general use or restricted use. In classifying a pesticide, EPA considers:

- The toxicity of the pesticide.

- The way in which the pesticide will be used.

- The effect of the pesticide on the environment.

When a pesticide is classified as restricted, the label will state "**Restricted Use Pesticide**" at the top of the front panel. To purchase and apply restricted-use pesticides, you must be certified and licensed through the Structural Pest Control Board (SPCB) or the Department of Pesticide Regulation (DPR). A **general use pesticide** is defined as one that will not harm the applicator or the environment to an unreasonable degree when used according to label directions. General use pesticides are available to the general public for use according to label directions.

8. Brand (trade) name. Each manufacturer has a brand name for each of its products. Different manufacturers may use different brand names for the same pesticide active ingredient. For example, Pendulum®, Pre-M® and Prowl® are trade names for the same herbicidal active ingredient, pendimethalin. It is not legal to use different brand-name pesticides interchangeably even if they contain the same active ingredient. The brand name shows plainly on the front panel of the label.

9. Ingredient statement. This statement, normally on the front panel of the label, identifies the name and percentage by weight of each **active ingredient**. Identified by chemical or common name, these are the components of the product that affect the target pest. The chemical name is often complex. For Lorsban and Dursban, for example, the chemical name is 0, 0-diethyl 0-(3,5,6-trichloro-2-pyridyl)-phosphorothioate. To aid communication, EPA-approved common names may be substituted for chemical names. In this example, chlorpyrifos may be substituted for the chemical name. Usually following the list of ingredients, the amount of an active ingredient is given in pounds per gallon or percent by weight. **Inert ingredients** allow active

ingredients to be formulated into many different products. As part of the formulation, they determine a product's handling properties. Inert ingredients need not be named, but the label must show what percent of the total contents they make up.

ACTIVE INGREDIENTS: 69.6%

Chlorpyrifos: 0, 0-diethyl

0-(3,5,6-trichloro-2-pyridyl)-phosphorothioate)

INERT INGREDIENTS: 30.4%

(Contains 6 pounds active ingredient per gallon)

10. Net contents. The front panel of the pesticide label tells you how much is in the container. This can be expressed as pounds or ounces for dry formulations and as gallons, quarts, pints or fluid ounces for liquids.

11. EPA registration number. This number identifies a specific product and signifies that the product has met federal registration requirements. This number must have a minimum of two sets of digits. For example, "264-458". The "264" indicates the manufacturer and the "458" is the specific number issued to the company by the EPA.

12. EPA establishment number. This number identifies the facility that formulated the product. In the event of questions or concerns regarding a product, the facility that made the pesticide can be determined.

13. Name and address of the manufacturer. The law requires the maker or distributor of a product to put the company name and address on the label. This enables consumers to know who made or sold the product.

14. Formulation. The front panel of some pesticide labels will tell what kind of formulation the product is. The formulation name may be either spelled out or designated by an abbreviation, such as **WP** or **W** for wettable powder, **D** for dust or **EC** for emulsifiable concentrate. This information is helpful for practical purposes because it provides insight about the type of application equipment that will be needed and the product's handling properties.

15. Physical or chemical hazards. This section will tell of special fire, explosion or chemical hazards the product may pose. For example, it will alert you if the product is so flammable that you need to be especially careful to keep it away from heat or open flame or if it is so corrosive that it must be stored in a corrosion-resistant container. This section is not always found in the same location within the labeling. Some labeling will identify physical and chemical hazards in a designated box while other labeling may list them on the front panel beneath the signal word. Others may list hazards under headings such as "Note" or "Important."

16. Limited warranty and disclaimer. This statement conveys the manufacturer's assurance that the product conforms to the chemical description on the label and that it is fit for label purposes if used according to directions under normal conditions. The warranty does not extend to any use of the product contrary to label instructions, nor does it apply under abnormal conditions such as

drought, tornadoes, hurricanes or excessive rainfall.

17. Directions for use. This section usually makes up the bulk of a pesticide label and begins with the wording: "**It is a violation of federal law to use this product in any manner inconsistent with its labeling.**" Products intended for use in agriculture will have an Agricultural Use Requirement box included in this section. It will contain the statement: "Use this product only in accordance with its labeling and with the Worker Protection Standard. The purpose is to inform those handling the product that the Worker Protection Standard (WPS) applies to the product. When the Worker Protection Standard applies, a statement regarding information on employee notification of restricted entry intervals and applications, proper training, decontamination, emergency assistance and personal protective equipment are stated here.

Directions for use include the following information:

The crops, animals, objects or **areas** to be treated.

The **amount** to use (per acre, per gallon of water, per 1,000 sq. ft., etc.).

The **method** of application and type of application equipment.

The timing and **frequency** of application.

Specific limitations on **reentry** to treated areas.

The **pests** controlled.

Limitations or restrictions, time between applications, methods of use to prevent adverse effects on the environment, crop rotation restrictions, warnings about use on certain crops or sites, and animal restrictions.

18. Storage and disposal. Label information about storage generally includes temperature requirements. In many cases, minimum and maximum storage temperatures will be provided. Some pesticides become ineffective if not stored under suitable temperatures; other pesticide labels may indicate that if freezing occurs and crystals form, then the product may be reused if it is warmed up. Information about storage usually includes such general statements as "**Do not contaminate feed, foodstuffs or drinking water**" and "**Store in original containers only.**"

Labels include information on **disposal** of pesticide containers as well as excess quantities of diluted pesticide mixtures. The label will inform users that leftover mixtures that can't be applied to a labeled site may be disposed of in an **approved waste disposal facility** that is in accordance with appropriate federal, state and local procedures. With disposal of liquid pesticide containers, the triple-rinse procedure will be stated in this section of the label and options such as recycling or disposal of punctured containers in a **sanitary landfill** will be given. Manufacturers of returnable and refillable containers will remind the user to return the containers promptly and intact to the point of purchase. The label will state that bags containing dry pesticide products should be emptied thoroughly into the application equipment and incinerated or discarded into a sanitary landfill. Many states have air quality regulations that do not allow open burning of pesticide containers. For more information on pesticides' disposal, call your local county agricultural commissioner.

Conflict with Labeling Exemptions

Definitions: Conflict with labeling means any deviation from instructions, requirements, or prohibitions of registered labeling concerning storage, handling, or use **except**:

- (a) A decrease in the dosage rate per unit treated:
The amount of pesticide (active ingredient) applied per job may be decreased as long as the label does not prohibit a decreased rate.
- (b) A decrease in the concentration of the mixture applied:
The dilution rate and total volume of diluent applied per acre may be increased (concentration decreased) as long as the total amount of pesticide applied per acre or unit does not exceed the label rate.
- (c) Application at a frequency less than specified:
A pesticide may be applied less often than indicated on a label.
- (d) Use to control a target pest not listed on the label, provided the application is to a commodity or site listed on the label and the use of the product against an unnamed pest is not expressly prohibited.
- (e) Employing a method of application not prohibited, provided other label directions are followed: Applicators may use a method of application not indicated on a pesticide label; however, the method employed must be consistent with rate and concentration directions and with precautionary statements. Additionally, a method which is inherently hazardous would constitute a violation of 3CCR § 6600 (e.g., "...Perform all pest control work in a careful and effective manner..."). This exemption is restricted by soil incorporation and chemigation policies (see below).
- (f) Mixing with another pesticide or with a fertilizer, unless such mixture is prohibited: This exemption allows the addition of registered pesticides or fertilizers to a pesticide mixture. It does not allow the addition of unregistered substances, such as sugar or vegetable oil, which are added to enhance the efficacy of the mixture. Any substance which is added to a pesticide to enhance the efficacy of a pesticide is defined in FAC §12758 as a spray adjuvant and must be registered as a pesticide. Some substances other than pesticides or fertilizers are allowed in tank mixes. They include deodorizers and pH buffering agents such as lime or Nutraphos and cleaning agents such as Nutra-Sol.
- (g) An increase in the concentration of the mixture applied, provided it corresponds with the current published guidelines of the University of California. The dilution rate and volume of diluent applied per acre may be decreased (concentration increased), only when such application rates are included in an authorized, current, printed guideline of the University of California Cooperative Extension for the particular formulation to be used. The crop to be treated must be included, and the per-acre dosage shall not exceed that shown on the pesticide labeling.

Exception:

Section 1991(b) of the California Code of Regulations (CCR) states, "Preconstruction application of termiticide for protection from subterranean termites **shall not** be made less than the manufacturer's label specifications."

PESTICIDE FORMULATION

Each pesticide contains a chemical or '**active ingredient**' (a.i.) which is responsible for its pesticidal effect, but pesticides are rarely supplied as preparations of neat, concentrated or technical grade chemical. The active ingredient must be FORMULATED with other nonpesticide compounds before it is ready to use.

Formulation generally improves the properties of a chemical for storage, handling, application, effectiveness and safety. The formulation of a pesticide is the form in which it is sold, not necessarily that in which it is used. By far the most popular and frequently used formulation is a spray, used for around 75% of pesticides. The formulation of pesticides as sprays or dusts allows small amounts of pesticide to be applied directly onto the pest or its immediate environment, but both of these formulations tend to have a problem with spray drift and distribution of pesticide onto nontarget areas. Where the pesticide doesn't have to be applied directly onto the pest but only delivered to a particular location where it will be available to the pest granules can be very successful, especially as they do not have the associated problem of spray drift.

SPRAYS

While sprays may be a very popular way to apply pesticides, only a few pesticides are very soluble in water and can be supplied as aqueous solutions or water-soluble powders. Most pesticide compounds are effectively insoluble in water and need an organic solvent or very specialized formulation to enable them to be mixed with water for spraying.

Emulsifiable concentrates

Concentrated solution of a.i. **in oil** with an emulsifier allows the concentrate to mix readily with water. The emulsifier is a detergent-like material that allows microscopically-small oil droplets to be suspended in water to form an emulsion. The concentrate disperses uniformly in water and will usually remain evenly suspended for at least a day.

Water miscible liquids/powders

Liquids or finely ground solids that mix readily with water. The a.i. is miscible with water or alcohol and so produces true, clear solutions that don't precipitate out.

Wettable powders (WP or W) or water-dispersible powders

The a.i. is mixed with a fine dust (usually clay or talc) and a wetting agent (usually dry soap or detergent), this allows the pesticide to be dispersed in water before spraying. The a.i. is insoluble in water and so without the wetting agent the powder would simply float on the water and be impossible to mix. **These formulations tend to 'settle' quite quickly** and need to be used quickly or agitated regularly if the concentration of the pesticide in the spray liquid is not to vary during spraying.

Flowable/sprayable suspensions or suspension concentrates

Pesticides that are not soluble in water can also be formulated as suspension concentrates, that is, as a suspension of very finely ground dust dilutant and a.i. in a nonsolvent liquid (usually water). This suspension will then mix well with water and can be sprayed in the same way as wettable powders.

These formulations have a tendency to sediment out if stored for long periods of time but this can be reduced by 'thickening' the liquid concentrate with polymers that tend to fix the solid in suspension. A similar formulation is the 'flowable micro encapsulated' in which the pesticide is held in small, permeable spheres of polymer or plastic 15-12 microns in diameter.

Oil solutions

The a.i. is dispersed in oil and applied as an oil-based spray. Many 'ready-to-use' pesticides come in this form. Oil solutions are most likely to cause damage to the finish of an asphalt tile floor covering.

DUSTS

The a.i. is mixed with a solid, particulate dilutant (usually with a size range of 50-100 microns) that is then mixed with the air with the aid of a dusting machine. Scoops, brushes or bellows dusters are used to apply dust. To keep dust from clumping in a duster when shaken, put a ball bearing or nut in the duster. Historically, dust has been the simplest to make, and easiest to apply. However, application rates are high, pesticide concentration rates low and hence while pesticide deposition rates on the target tend to be low they are also prone to spray drift onto nontarget areas.

Dusts may be formulated as:

undiluted toxic agent - e.g., sulfur dust in agriculture

toxic agent + active dilutant - e.g., insecticide + sulfur dust as dilutant

toxic agent + inert dilutant - e.g., insecticide + clay as dilutant.

GRANULES

Granules are small pellets (usually 0.3mm - 1.3mm) of an inert carrier (often clay) mixed with the pesticide a.i. to give the desired concentration. Granules can be formulated to allow either rapid release of the pesticide or slow, controlled release over time. Granules can also be particularly useful when dealing with very toxic pesticides which can be 'shut away' in the granule, allowing them to be handled more safely. A hand-operated spreader will be used for granule applications. The granules are mostly used to treat soil insects.

AEROSOLS

To be used in an aerosol the pesticide must be soluble in a volatile, petroleum solvent when pressurized. When the aerosol is sprayed and atomized, the solvent evaporates rapidly which leaves micro droplets of toxicant suspended in the air. Usually used for indoor application of insecticides, repellents and disinfectants.

Pyrethrin or synthetic pyrethoid formulations are commonly used for fogging residential and commercial buildings. They have low toxicity and short residual.

FUMIGANTS

Fumigants must be vaporous liquids or gases with a relatively high vapor pressure so that they can exist as a gas in high enough concentrations to kill pests in soil or enclosed spaces. The toxicity of the fumigant is proportional to its concentration and the exposure time. Fumigants are widely used for soil treatment to control insects, nematodes, soil-borne diseases and weed seeds and in stored-product pest control. The number of chemicals suitable for use in fumigation is limited, examples include hydrogen phosphide, methyl bromide, ethylene dibromide and dichlorvos.

BAITS

The pesticide is incorporated with a 'bait' which attracts the pest to the pesticide. The bait may be either food which is then eaten by the target animal (as in vertebrates and molluscs) or an attractant which is used to lure the target to the bait where the pesticide is transferred by contact (as in many insects). One of the main advantages of baits is that, used properly, there is practically no release of pesticide into the environment. The bait stations should be labeled. The label should contain the pesticide name, the signal word, name, address and telephone number of the company.

SLOW RELEASE FORMULATIONS

There are many potential advantages to being able to control the rate at which a pesticide is released into the environment. Rather than applying a single, big dose of pesticide the same amount released over a period of time will have a much greater pesticidal effect. In theory, it should be possible to deliver a constant dose of pesticide to the pest environment over time.

Pesticides Equipment

The choice of equipment for pesticide applications is only as efficient as the knowledge of the person using the equipment. It is imperative that the pest control applicator acquaint himself with the limitation of whatever device he chooses, so the ultimate in control can be accomplished. Ignoring this simple rule causes, perhaps, more failure in the control of pests than any other factor. The formulations of today's pesticides demand that proper equipment be used in order to disperse the pesticide at the prescribed rate, prevent drift, avoid over-application and create spray patterns that do not leave voids or cause excessive run off.

Power Sprayers There are several variations of the power sprayer, but most have common components. The major components are as follows:

1 - The Tank

The tank should be of a capacity appropriate for the job. It should be made of either stainless steel, aluminum, fiber glass, plastic, or steel which coated interiorly with a protective lining or is galvanized. A secure hatch should cover the opening to avoid spillage of the formulation while in use.

2 - Pumps

The pump is the most important part of the spraying system. It is important that it be chosen to satisfy the widest range of applications unless its use is for a single purpose.

A- **Roller Pump:** provide volumes at low moderate pressure. They used best with non-abrasive formulation

B- **Diaphragm Pump:** used to deliver low or high volumes. They can be used also with high pressure application.

C- **Piston Pump:** by far the most common and efficient pump and has the capability of performing over a wide range of use in the application of chemicals used in structural pest control. It has the ability to produce large volumes at high pressures yet can be regulated to deliver at lower rates and pressures.

3 - Agitators

Means by which the contents of a spray tank is mixed and agitated. The purpose is to keep the pesticide in continuous suspension so that it results in an even distribution of the material

4 - Check Valve

Prevents liquid from entering the pump unit.

5 - Pressure Regulators

The purposes of pressure are twofold. They regulate the operating pressure and serve as a relief valve. It is installed at a point between the flow from the tank and the flow to the nozzle and the regulator body provides for a bypass or return flow to the tank. The indicator or gauge for pressure is located adjacent to or is a component part of the regulator and records the pressure as pounds per square inch. The pressure in the tank must be correct to match the nozzle tip in use. Increasing the pressure in the tank will increase the spray drift and the contamination of nontarget areas.

6 - Strainers

Strainers and screens are designed to prevent foreign particles from entering system. They are

6 - Strainers

Strainers and screens are designed to prevent foreign particles from entering system. They are located at the filling opening, suction line to the pump and at the nozzle tip. If the strainers are not properly serviced, they may cause severe pump damage. Make sure the strainers and the nozzles are clean. Use soft bristle brush to clear the sprayer nozzle. Before leaving your shop to do a pesticide application, make sure that you have all the PPE, the label of the pesticide you are planning to use, and that your equipment is in good repair.

7 - Hose

The purpose of the hose is to convey a liquid from the power source to the target. The material of which hoses are made varies considerably. Originally, most were constructed of natural rubber, but today, synthetic rubber, plastic or both are commonly used.

8 - Nozzles

There are many types of nozzles. Of primary concern is that the specific type provide the pattern desired. In most cases, the pattern is confined to a solid or pin stream, to a fan, or to a hollow or solid cone nozzle. Use a fine pin stream and low pressure when conducting a crack and crevice treatment. The capacity of the pump, the pressure on the liquid, the friction loss and size of the hose, and the size of the orifice in the nozzle will all govern the ultimate gallonage delivered from the nozzle.

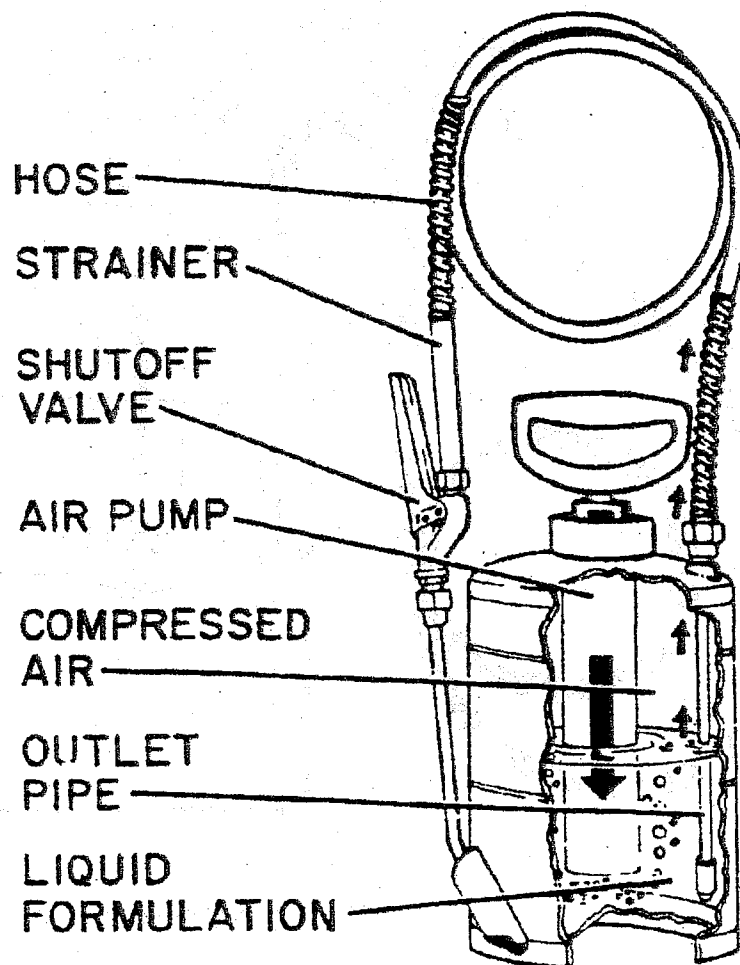
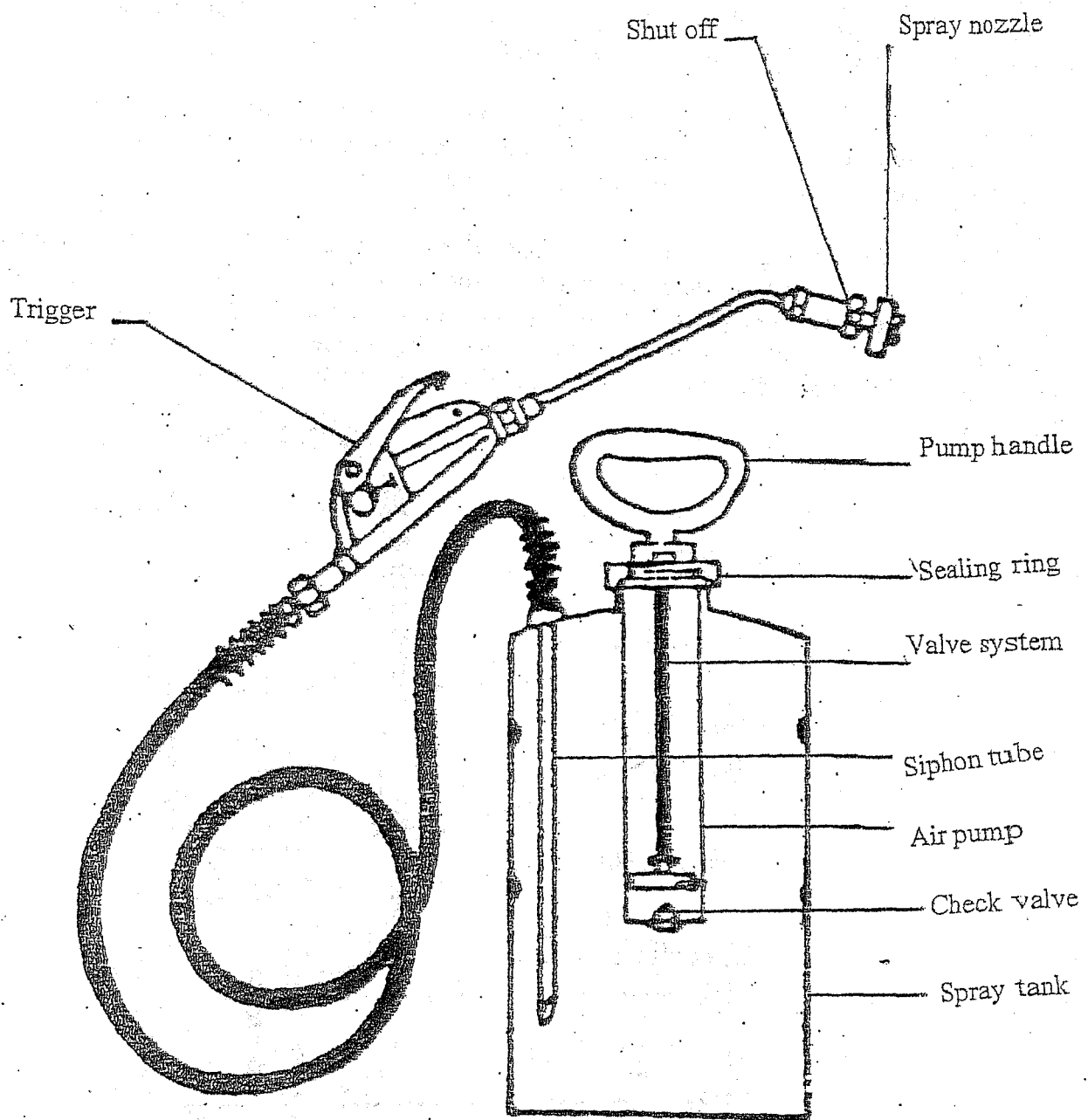


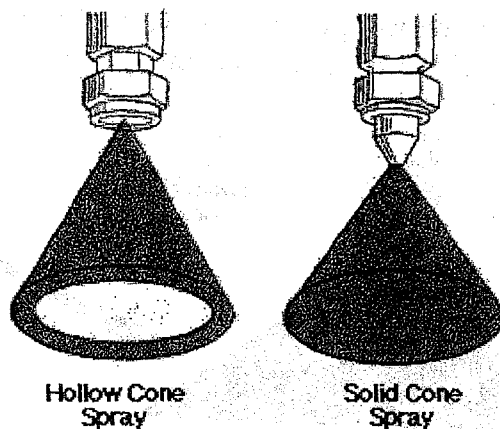
Figure 4-1. Compressed-Air Sprayer



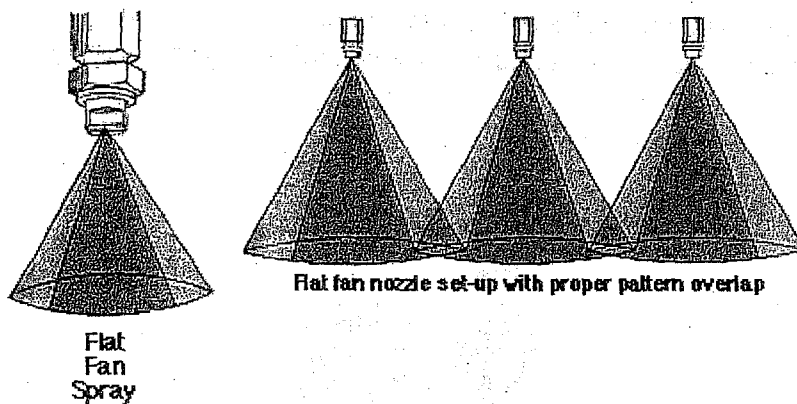
Compressed Air Sprayer

Nozzle Spray Patterns

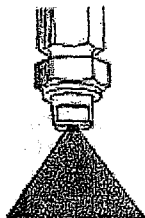
Hollow cone and solid cone nozzles produce a circular pattern. Hollow cone nozzles generally make finer, smaller particles than the solid cone. These nozzles are used on handgun sprayers and row crop sprayers. They generally penetrate foliage well and are used to apply fungicides, insecticides and sometimes herbicides.

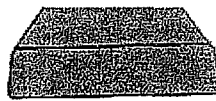


Flat spray nozzles are used to broadcast most types of pesticides. The pattern is fan shaped with gradually tapered edges. Uniform coverage across the sprayer width is achieved by overlapping the tapered portion of the pattern. This is also a common spray pattern used for applying structural pesticides to floor or wall surfaces.



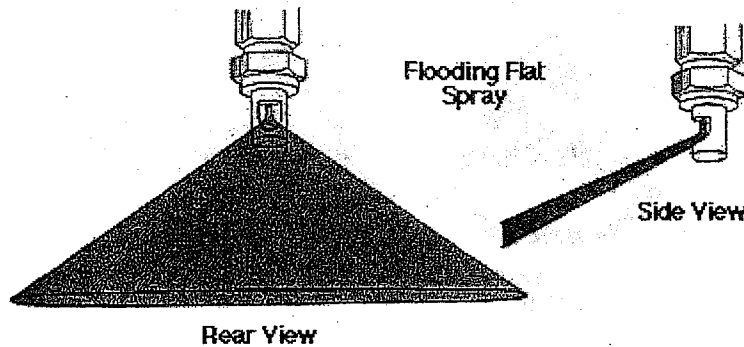
Even spray nozzles produce a narrow rectangular pattern with a sharp cut of edges. They are used for band applications of chemicals and are frequently used with planting equipment.



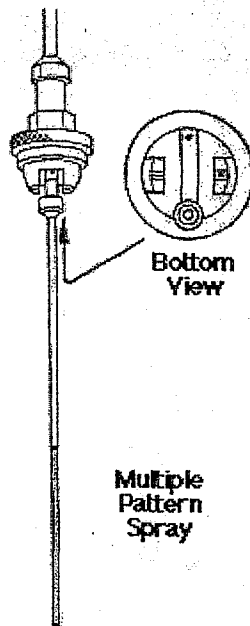


Even
Fan
Spray

Flooding nozzles are often used for broadcast application of fertilizers, herbicides and defoliant. They deliver a wide flat spray pattern consisting of large droplets. They can be mounted on a boom in a variety of positions and are sometimes used alone for boomless broadcast spraying.



Multi-pattern spray nozzles are used on professional hand held sprayers and usually provide the applicator with a choice of different patterns built into one nozzle. Usually two flat fan patterns are available; one that produces fine particles and low volume patterns and a large volume fan with large particles. Another pattern will be the pin stream, used to apply the pesticide into a hole or crevice. There may also be a "crack and crevice" accessory tool attached as well. The applicator selects these patterns by loosening the nozzle collar and turning the nozzle body so that the desired pattern is used.



Non-Power Sprayers

Types:

A- **Aerosol dispenser:** pressurized metal insecticide containers. They usually have a capacity of 1 pound or less.

B- **Hand carried ultralow volume generator:** primarily designed to disperse technical grade or highly concentrated pesticide formulations. Use it for space and residual treatments to control household pests indoors.

Dusters

Precautionary measures in the use of dust equipment consist of the following:

1. Because dusts are usually exerted under some degree of pressure, all working parts of the equipment should be carefully examined. All literature provided by the manufacturer should be read carefully.
2. Goggles and respirators should be included in the safety equipment.
3. The applicator should be acquainted with operations and limitations of each piece of equipment he uses.
4. Complete removal of dust remaining in the hopper and any extensions of the duster should be accomplished after the completion of each job.

Types of dusters

A- **Rotary duster:** powered by electricity which is not always available. They are good for applications with large amounts of dust. They are useful for applying pesticides to control fleas, ticks, or other ectoparasites around buildings.

B- **Compressed air duster:** is converted from a fire extinguisher. They will operate efficiently and will distribute large volumes of dust in a short period and is mainly used to dust large confined areas such as crawl spaces under buildings.

C- **Getz applicator:** simple device in which a spring is surrounded by a rubber sleeve sealed at one end by a filler plug and the other by a small release tube. The capacity is very small (6 ounces) and it is usually only used for crack and crevice treatment. Small void areas can be expertly treated with this device.

D- **Bulb duster:** designed for careful indoor work in areas such as electrical boxes where liquid pesticides can't be used. These types of dusters are especially useful in cockroach control work.



Figure 4-14. Plunger Duster

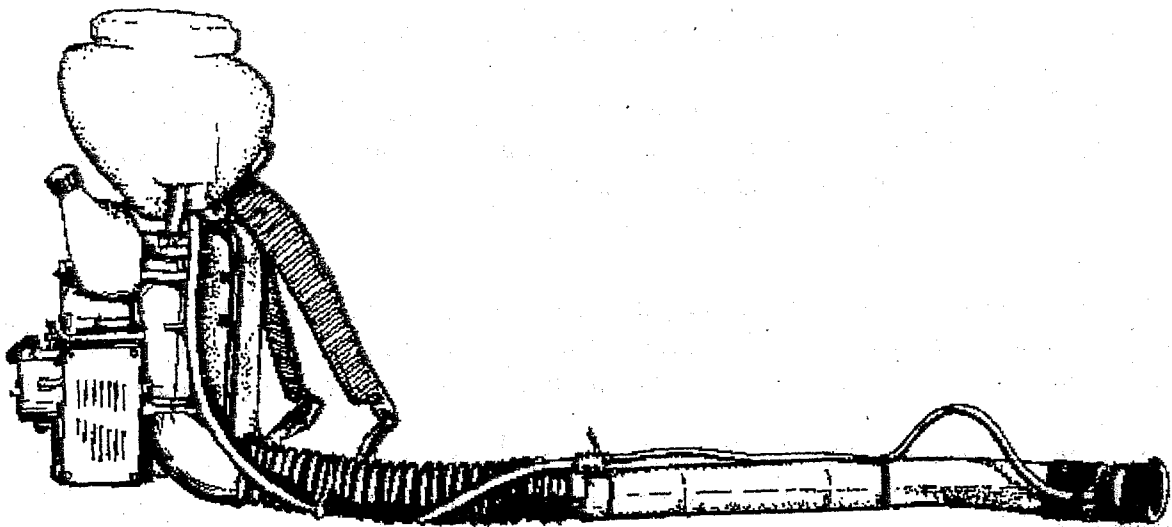


Figure 4-10. Backpack Mist-Dust Blower

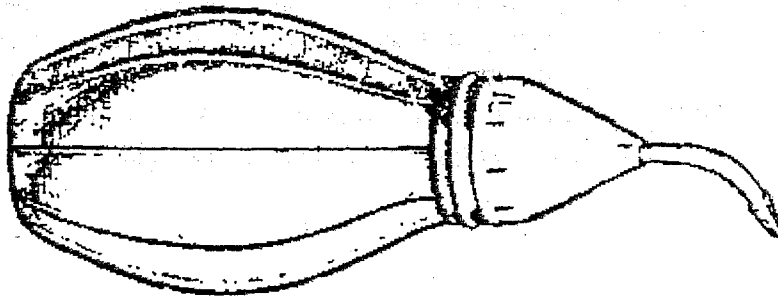


Figure 4-16. Bulb Duster

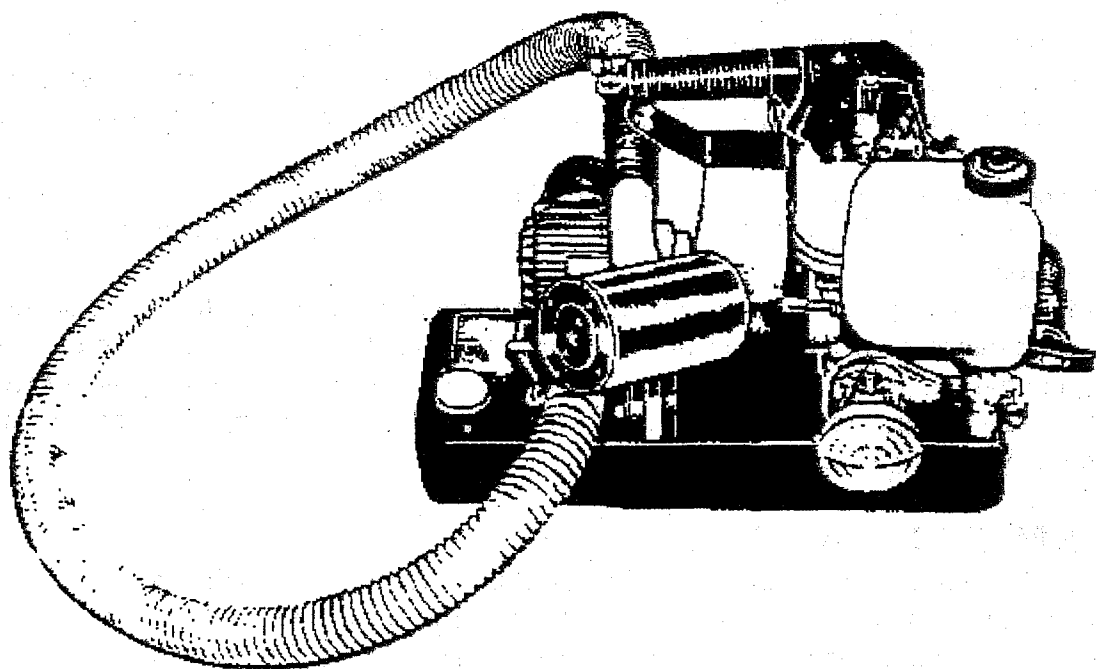


Figure 4-3. Hand-carried ULV Generator

Getz Applicator



Figure 1. Getz Applicator

TERMITES

Subterranean and Drywood are the two types of termites that cause damage to buildings in Southern California. The homeowner can help prevent infestation to his buildings and can save a great deal of unnecessary expense by familiarizing himself with these insects and their habits.

Drywood termites live inside wood and do not make contact with soil. They get the moisture they need to live from humid air. For this reason, Drywood termites are most common along humid coastal areas.

Subterranean termites live in the soil and must maintain contact with the ground or some other moisture source to survive. They build earthen tubes from the ground into the structure for protection from predators and to help maintain a moist environment. In some rare situations, if water and wood are available from a source other than the soil, subterranean termites can establish a colony with no ground contact.

TERMITICIDE APPLICATIONS

To treat subterranean termites, the pesticide will be injected into the soil. The sub-slab injector is designed to inject chemicals through holes drilled through concrete slabs. You insert the nozzle through the concrete slab and inject the pesticide with pressure(about 40 pounds). Another method used for treating subterranean termites is trenching and rodding. Trenches must be dug at specified intervals, the chemical is mixed with soil, and the trench is filled with the soil.

The repellent termiticides are all pyrethroids. Pyrethroids are fast acting nerve poisons that are highly toxic to

low toxicity to
of the pyrethroid
include Dragnet
Talstar, Demon,
should consider
foundation when
application. The
influences how
structure, the
formulation to
method of the
application you

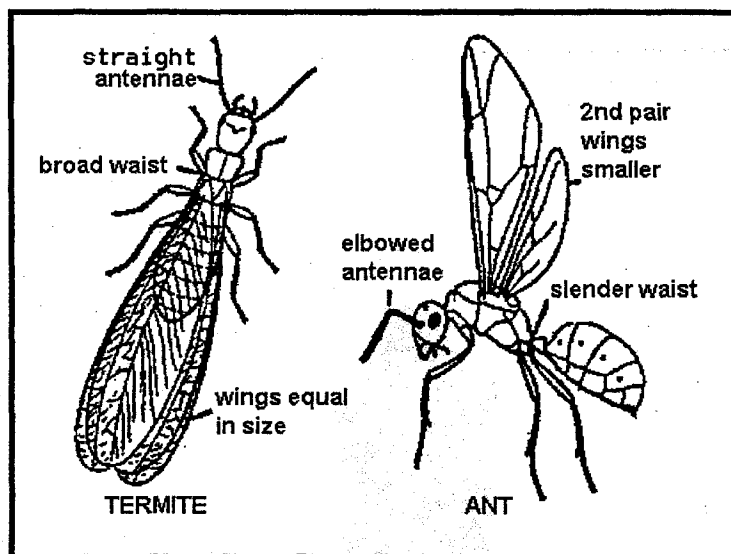
Flying ants and termites are tell apart. relatively

while ants have elbowed antennae. Termites have two pairs of wings that are equal in length. Ants' forewings are much longer than the hindwings. The abdomen of the termite is broadly joined to the thorax while the abdomen and thorax of the ants are joined by a narrow waist.

Most carpenter ants can be easily distinguished from other species of ants by their large size-up to ½ inch long. Common species are dark, often black. Carpenter ants cannot sting but if handled

termites but have mammals. Some termite products FT, Cynoff, and Prelude. You the structural making a pesticide foundation insects may enter a type of pesticide use, and the pesticide make.

swarming often difficult to Termites have straight antennae



How to tell winged ants from termites.

can inflict a painful bite with their powerful jaws. They emit a noxious excretion of formic acid when disturbed. Winged ants, which leave the nest to mate and establish new colonies, are sometimes confused with termites. Although ants do not eat wood, they bore into wood to make their nests, which consist of extensive networks of galleries usually begun in areas soft from decay. Indoor carpenter ant nests are bored into wooden parts of the building, sometimes causing serious structural damage. They also nest in wall voids, hollow doors, cracks and crevices, furniture, and termite galleries. Infestations can occur in new buildings when land clearing in the area disturbs existing native colonies. In the wild, carpenter ants nest in soil and beneath rocks; they bore into living and dead trees and stumps.

Carpenter ant sawdust is considerably different from the pelletized frass left by drywood termites. Once colony openings are located, apply insecticide formulations or desiccant dusts through these openings and other holes drilled into the galleries. Desiccant dusts are inert dusts combined with absorptive powders that destroy insects by absorbing their protective outer body cover, causing them to dry out, or desiccate. Of the desiccant dusts, diatomaceous earth is readily available in retail stores, but silica gel may only be applied by a licensed pesticide applicator. Desiccant dusts are low in toxicity to people and do not lose their effectiveness over time, as long as they do not get wet. Avoid inhaling these materials, however, because they can cause serious lung irritation. Also, avoid the use of chlorpyrifos and Diazinon; landscape and residential use of these materials in urban areas has been identified as a source of pollution for California's creeks and rivers.

Liquid termiticides are usually applied completely around and underneath a structure covering all areas where termites might gain access. For new construction, this is accomplished by treating the graded soil before the slab is poured. For an existing building, the perimeter of the foundation is trenched and drilled then treated with the termiticides. The goal of the treatment is to put a chemical barrier between the termites in the soil and the structure above. The chemical barrier can also affect those termites inside a building by preventing their return to the soil. In most cases these termites will die of dehydration.

If you use toxic baits, be sure to use slow-acting formulations so that the ants carry it back to reproductives and larvae deep inside the nest. This is important because fewer than 10% of the worker ants are out foraging at any one time. Boric acid baits that have a low concentration (less than 1%) of the active ingredient and are formulated in a sweet liquid are slow acting and nonrepellent. Because carpenter ants can be finicky eaters, first attract them to a nontoxic food like a sugar-milk solution or sliced crickets. Once they are feeding from this food source, replace it with several different toxic baits that are labeled for ant control, and let them choose the one they prefer. When selecting any insecticide, be sure it lists ants on the label.

CALIBRATION OF PESTICIDE APPLICATION EQUIPMENT

I. OBJECT OF CALIBRATION

Apply uniformly, and in the desired areas, the proper amount of active ingredient.

Advantages: proper pest control, and minimum of pollution and cost.

II. PRINCIPLES OF CALIBRATION

A. Be certain of two things:

1. Nozzle output and pattern are the one desired and is uniform where desired.
2. The amount of liquid applied per unit is known, and constant.

B. In order to do this:

1. Pressure at the nozzles must remain constant, and must be at the desired value when calibrating.
2. Speed, or rate of travel, must be known, remain constant and be at the desired rate when operating.

III. OUTLINE OF PROCEDURE

A. Use water for calibration.

B. Test operate in the field (with water), adjusting to desired values:

1. Spray patterns - including Pressure.
2. Speed of operation noting both distribution and quantity of water on the plant and/or soil.
3. Record:
 - a) pressure
 - b) speed of travel - either MPH or gear and engine RPM

IV. CHECK FOR AMOUNT AND UNIFORMITY OF WATER OUTPUT

A. Operate at the selected Pressure.

B. Catch and measure all nozzle output for known time (compare nozzle output and change tips to get reasonable uniformity).

C. From ground speed and width of coverage calculate time to cover 1 acre.

D. From mean nozzle output per unit time (B. above), number of nozzles, and time to cover one acre calculate gallons per acre applied. This is a basic number for dilution. It can be changed in direct proportion to change of speed (inversely).

Note - The calibration is valid ONLY:

- 1) at that speed
- 2) at that pressure
- 3) at that mean nozzle output

V. CARE OF EQUIPMENT

*The calibration is only as good or useful as the care given the equipment.

Here are some routine care items; each piece of equipment has special care needs in addition.

- 1) Clean the tank - at least by flushing.

- 2) Clean the screens - suction and pressure side.
- 3) Flush entire system, unclog nozzles carefully.
- 4) Periodically, while flushing, check nozzle output for changes.
- 5) Check hoses for cracks, cuts, or worn areas.

Clean sprayers after each day's use. Wear appropriate protective clothing when cleaning any piece of application equipment.

***Some useful numbers:**

There are 43,560 square feet per acre.

One gallon of water weighs about 8.3 lbs.

One mile per hour is 88 feet per minute.

HELPFUL MEASURING TABLES FOR MIXING PESTICIDE

Pesticides that are bought in large packages or sizes usually do not include instruction for mixing smaller amounts of a spray. The following table compares various measurements that are needed to make smaller amounts of a spray.

3 teaspoons	= 1 tablespoon
2 tablespoons	= 1 fluid ounce = 6 teaspoons
4 tablespoons	= 12 teaspoons = 1/4 cup = 2 fluid ounces
1 cup	= 16 tablespoons = 8 fluid ounces
2 cups	= 32 tablespoons = 1 pint = 16 fluid ounces
2 pints	= 64 tablespoons = 1 quart = 4 level cups
4 quarts	= 8 pints = 1 gallon = 16 cups
16 ounces	= 1 pound
6 tablespoons (level)	= approx. 1 oz. of dry weight (for WP only)

If a pesticide label states that the product contains 4 pounds of active ingredients per gallon, the amount of active ingredient in each quart is $4 \div 4 = 1$ pound. (One gallon has 4 quarts) In a pint is $4 \div 8 = \frac{1}{2}$ pound (1 gallon has 8 pints).

- **Inspect equipment daily**
- **Check equipment for leaks or signs of wear**
- **Wear personal protection equipment when repairing or handling pesticide equipment**

HANDLING PESTICIDES

Whenever pesticides are transported, stored, mixed, loaded or applied, several things need to be kept in mind. Keep unauthorized people away, especially children, when handling pesticides. Be safety conscious, and always read pesticide labels.

Storing Pesticides

Proper storage of pesticides can greatly reduce accidents. Store pesticides in well ventilated, dry areas. Post storage areas and buildings with signs reading "Danger - Pesticides." The signs will also inform fire fighters that pesticides are present. **Keep the storage area locked.** Pesticides can be very harmful when in the wrong hands. Always keep children, animals and unauthorized persons away from pesticides. Don't keep large amounts of pesticides on hand. Only purchase them as you need them. Keep an inventory of pesticides and chemicals in storage. Keep the pesticides in their original containers. **Never put them in unmarked or food containers. Never store pesticides with food products, livestock feed, or fertilizer. Also, store personal protective equipment in a clean area away from pesticides.** Periodically check pesticide containers for leaks or corrosion.

Transporting Pesticides

Transport pesticides carefully. Inspect the vehicle being used to transport the pesticides. Make sure it is functioning properly. Transport the pesticides in the **back of the truck bed.** During loading, check for leakage, make sure caps are secured, read the labels and count the number of containers. Make sure pesticide containers cannot roll around or fall out. Prevent the containers from moving by tying down, blocking and bracing them. **Never** transport pesticides with food or feed. **Never** allow anyone to ride with the pesticides. **Never** carry pesticides in the passenger seating area.

Be prepared for a spill during transportation. Carry a safety kit for use during clean up. The kit should contain an index card with emergency numbers, duct tape, a shovel, a respirator, goggles, rubber gloves, protective clothing, soap and wooden dowels to plug leaks. Also, carry kitty litter or sand **as an absorbent material.** If a spill happens, control and contain it. Put on safety equipment and secure the area. Contact the proper authorities for help. In case of a vehicle accident involving spilled pesticides you should call the highway patrol.

Mixing Pesticides

Mix pesticides carefully and accurately, using only the recommended amount. Read the label carefully and follow the directions exactly. Wear gloves, splash-proof goggles or face shield, and other required personal protective clothing. Keep hands away from the face, head and neck when mixing. Open liquids on a level surface and **below eye level** to avoid spilling and splashing. Pour liquids below eye level and as close to the ground as possible. Do not try to pour from a container that is too heavy. Open powders with scissors to avoid dust. Use the proper measuring tools when mixing pesticides. Mix pesticides outside or in a well-lit and ventilated area. Use extreme caution while mixing and loading pesticides since most injuries occur while handling the chemical concentrate.

When mixing pesticides together, the toxicity, the mode of action, and its effectiveness change. Mode of action is the way a pesticide destroys or controls a target pest. Understanding the mode of action helps you select the proper pesticide and determine how to apply it.

Loading and Mixing Pesticides

Remember to check the weather conditions when loading and mixing pesticides. Stand with your back to the wind so the pesticide will be blown away from you, not on you. Keep your head well above the tank opening to prevent pesticides from splashing in your face. Do not use your hands to stir pesticides or retrieve something that has fallen into the tank. Close all containers as you finish with them.

Select the right equipment, use it correctly and take good care of it. Install an approved **antisiphoning device** to prevent back siphoning into the water supply. An air gap between the source and the spray tank should be maintained. Fill the spray tank with water and add the pesticide last. This way, the filling hose will not be contaminated. Add pesticide to the water-filled tank away from the water source. Preferably, pesticides should be added while the sprayer is in the field. If pesticide must be added first, secure the hose to the top of the tank out of the liquid so it is not drawn in. Use check valves. Never leave filling operations unattended to avoid renvers. Protect well heads, and never store chemicals near wells.

Applying Pesticides

Set application equipment for the correct delivery rate and operate at the recommended speed for proper coverage. Check the sprayer for any loose connections or worn hoses. Know and maintain the proper pressure and speed to avoid damage.

Check the weather conditions when applying pesticides. It is **against the law to apply pesticides on windy days** when they might drift on to nearby fields. Excessive heat and rain can also affect the effectiveness of a pesticide. Turn the sprayer off when turning around at row end. Shut off the sprayer when you are moving from field to field. Don't apply pesticides **when heavy rain is likely** because they could be washed into non target areas.

Should the equipment become clogged or not work properly when spraying, take the necessary precautions when fixing it. Protect yourself with gloves and eye protection. Use a brush or soft copper wire to clean out clogged nozzles. **Never use your mouth.**

After spraying fields, obey re-entry periods. Post warnings around the treated areas and verbally warn others to stay out until it is safe too re-enter. Before treating an area you should set up a treatment pattern to avoid contaminating your self.

Avoid applying excessive amounts of pesticides. Follow the label regarding the required amount of pesticide to kill the target pest and do not exceed this amount. Take care to treat only the affected area. A misapplication may occur if the application travels outside the affected area. The misapplication may damage the environment if the pesticide runs into a drain or onto a nontarget pest. It may also expose the applicator and/or company to lawsuits filed by the homeowner or affected neighbors.

Pesticide drift

It is the physical movement of spray particles through the air from the target site to any non- or off-target site. **Wind speed** greatly influences the amount of drift. After wind speed and direction, spray **droplet size** is the most important factor influencing drift. Larger droplets are heavier and less likely to move off-target. One of the simplest methods to **increase** droplet size with any nozzle is to **reduce** nozzle pressure.

How to Handle Pesticide Spills

Accidents happen. When an accident happens with a pesticide, it is especially important to be prepared. Always read the label before buying and using a pesticide. Be prepared to handle a pesticide spill before you handle a pesticide.

First, do everything you can do to **prevent** a spill or pesticide accident. Never handle pesticides in a kitchen or high-traffic areas. Keep others away from where you are mixing and applying the pesticide, especially children and pets. Mix the pesticide outdoors or in a well-ventilated area.

BE PREPARED

The pesticide label may give you specific information on how to handle a spill. If it doesn't, here are some recommendations. You should be wearing the personal protective equipment and clothing before you open the pesticide to mix and apply it.

To be prepared for a spill, have rubber gloves, rubber or plastic foot coverings and protective eyewear ready to put on, if you are not already wearing them.

Have **dry absorbent** materials available ahead of time to soak up spilled pesticide. This can be material such as cat litter (best), sawdust, sweeping compound, newspapers or paper towels. These materials can also be used to clean up other spills such as paints, solvents and fuels.

Have **local emergency phone numbers** near your telephone. Have these numbers written large enough so that you can see them with uncorrected vision. Pesticides have an emergency phone number(s) on the label. Write this number down ahead of time, along with the product name. If you need this information in an emergency and you need to read the label, they may be hard to find or too small to read in a hurry or may be obscured or otherwise unreadable.

If you spill formulated pesticide product on you, or a large amount of mixed spray, remove your clothes and shower immediately. If you have a pesticide spill, you should:

- 1) Control the spill. If a pesticide container, sprayer, bag or spreader tips over, quickly set it upright to keep more pesticide from spilling out.
- 2) Contain the spill. Keep spilled liquid material from spreading by covering it with absorbent material, such as soil, sand, sawdust, peat moss, rags, paper towels, newspaper or cat litter.
- 3) Clean up the spill right away. Absorb liquids with cat litter, soil, peat moss, paper towels, newspapers or sawdust.

Carefully sweep up or **collect the absorbent material**. Put these pesticide-contaminated materials in a plastic bag. Do not throw the plastic bag in the trash. To clean up the spill, wear chemical-resistant gloves to handle the spilled pesticide and cleanup materials. If you need to leave the spill to get help or if you have spilled a dust formulation, put absorbent materials on the spill or cover it. Block access to the spill. Keep children and pets away from the spill. If you spill a liquid, consider the need to dike the spill so that it will not run off to other areas. Do not wash down spills with water. Spread absorbent materials on the spill. Sweep or scoop this

material up and put it into a heavy-duty or doubled plastic bag.

Next, clean the area with heavy-duty detergent or bleach. Use as little liquid as possible. Don't rinse this away. Absorb this material also and place it into the plastic bag and seal it. Place the bag in the trash. Many pesticides, especially organophosphate insecticides (e.g., Malathion, Diazinon, chlorpyrifos), can be neutralized with household bleach. Remember that bleach can be hazardous, and it is also a pesticide. If you use bleach, first absorb the spill, as explained above, and then use the bleach. Use only the amount of bleach you may need to cover the spill. Soak up the bleach with absorbent material also. Again, don't wash down the spill area with water.

Any and all materials used to clean up the spill must be **properly disposed of**, including the broom. Small quantities of spilled homeowner pesticides and cleanup materials can be placed into a heavy-duty plastic bag and securely sealed and disposed of in household trash.

Don't forget to wash off or decontaminate any clothing or equipment that gets pesticide on it. After you clean up the spill, wash your hands and any exposed areas of your skin with soap and plenty of water. Shower if necessary. If you get a small amount of diluted pesticide on your clothing, you can wash this clothing separately from other family laundry with a heavy-duty detergent. If you spill a formulated product on your clothing, you may need to dispose of this clothing along with cleanup materials. Wrap contaminated tools and empty pesticide containers in several layers of newspaper and place in the trash.

If you or someone else is directly exposed to a pesticide, wash the pesticide off the skin with plenty of water for at least 15 to 20 minutes. Get medical attention as soon as possible.

If a pesticide fire occurs, evacuate the immediate area or building, isolate the area around and downwind of the fire, and call the fire department.

Always mix pesticide outside or in well ventilated area

Never mix or transfer pesticides near water sources

Never carry pesticides in the passenger section of your car, van, or truck. Hazardous vapors may be released and make the driver and other passengers ill. Pesticides may cause illness or injury if they spill on you or your passengers. It is nearly impossible to completely remove spills from the fabric of seats and floor mats. They can cause future contamination if they are not cleaned up correctly.

Never allow children, other passengers, and pets to ride with pesticides.

Never transport pesticides with food, clothing, or other things meant to be eaten by or in contact with people or animals. The risk of contamination is too high. Even small amounts of pesticide could contaminate these highly sensitive items.

Never leave your vehicle unattended when transporting pesticides in an unlocked trunk compartment or open-bed truck. You are responsible and liable if curious children or careless adults are accidentally poisoned by the pesticides. Whenever possible, transport pesticides in a locked compartment.

Personal Protective Equipment

Wearing the proper clothing and equipment is just as important as using the right machine for a job. Personal protective equipment (PPE) **must be provided by the employer** when required. The employer is responsible for cleaning and maintaining the PPE as well as insuring each handler wears and uses it correctly. Each handler needs to be provided with a clean place to put on and remove PPE and to store personal clothing. The employer must take action, if necessary, to prevent heat-related illness while wearing PPE. The employer needs to insure that any handler does not take home PPE that has been exposed to pesticides.

People wearing PPE also must properly clean and maintain it. Clean, inspect and repair PPE according to the manufacturer's instructions before each use. Dispose of PPE that is nonreusable or cannot be cleaned. Wash and store PPE separately from personal clothing.

Become familiar with the types of pesticides used at your job. Knowing the types of pesticides used determines the protective clothing and equipment needed to handle them. Consider the nature of the pesticides and the proximity of the chemical to points of entry on your body-- dermal (through the skin), oral (through the mouth) or inhalation (through the lungs). Dressing for the job and understanding the potential risks of pesticide exposure are a must for anyone who handles, mixes, loads or applies chemicals.

Clothing

Protective clothing can be divided into two groups: **disposables and reusable**. **Reusable** protective clothing is usually made of laminated woven or nonwoven fabric like rubberized rainwear. Research has shown that this type of equipment provides excellent protection against all types of pesticides, including spills of liquid concentrates. Advantages are that it is reusable and can be cleaned. However, it is expensive, heavy and uncomfortable in warm weather.

Disposable protective clothing is usually made of spun bonded (nonwoven) fabrics that do not absorb pesticides as quickly as woven materials. The most popular type of spun bonded disposable clothing is the Tyvek™ suit. This type provides an effective barrier to several pesticide sprays and dusts. Your employer must provide you with clean coveralls when you handle pesticide with the signal word Danger or Warning or any minimal exposure pesticide.

Respirators

Respirators protect the lungs from chemicals. A respirator should be used whenever there is a chance of exposure to high concentrations of pesticide in enclosed spaces. Respirators must be selected based on the chemicals used, since they do not protect all contaminants under all conditions. Information detailing what type of respirator to use is located on the chemical label or should be listed in the farm's chemical logbook. Anyone required to wear a respirator must have a medical check up before using the respirator. Some people may not be able to work wearing respirators. Every respirator must be purchased to fit the person wearing it. Many things can affect how a respirator fits, and each person is different. Test your respirator before mixing or spraying chemicals. If it fails, stop your work immediately. Your employer should provide you with a training on the fitting and testing of the respiratory equipment.

Two Types of Respirators

Chemical cartridge respirators have a partial face mask fitted with one or two replaceable cartridges. These cartridges contain an absorbent material (often activated charcoal) that purifies inhaled air and filters dust particles. Cartridge respirators are effective against all but the most toxic vapors. They provide added protection when spraying toxic pesticides, using toxic chemicals in confined areas, or hand spraying certain crops. Always use NIOSH-approved respirators. Cartridges have a limited capacity of protection. Make sure to replace the filter and cartridges as needed. Older cartridges may not protect the applicator against inhalation of pesticide vapors and gases. The respirator itself can be cleaned by soaking the gasket and valve parts in a solution of warm and mild liquid detergent and remove any pesticide residue.

Powered-air purifiers may be preferred for excessively high concentrations of dusts or pesticides. The devices use the same filter materials mentioned above, but have a motor-blower assembly that forces air through the filter and into the breathing zone of the wearer. Breathing is much easier because drawing air through the filter requires no effort. Supplied-air respirators deliver air through a breathing tube connected to the wearer's face piece, helmet or hood.

Eye Protection

Protective eyewear should be carefully selected, fitted and cleaned. When handling and applying chemicals, **wear** splash goggles or full face shields. **Never** wear contact lenses when handling ammonia or other farm chemicals. Water may be needed to irrigate chemical spills occurring in the eyes. Special eye wash faucets should be installed in areas where chemicals are handled.

Hand Protection

A farmer's hands might come into contact with chemicals. Cuts and abrasions on the hands may allow toxic chemicals to enter the body. Use appropriate gloves, barrier creams, hand cleaners and lotions to protect hands. Wearing gloves that match the job provides good hand protection. When mixing wet chemicals, use gloves made of unlined rubber. Only sound, properly fitting gloves should be worn. Tight gloves limit dexterity and are uncomfortable. Overly large gloves can interfere with work. Gloves to protect the hands from chemicals can be made of rubber, plastic or other materials and should be unlined. **Never use leather gloves.** Gloves should be long enough to cover the entire hand and part of the forearm. Wearing long sleeves will provide an extra barrier for the skin along with the gloves. Wear your sleeve outside your gloves to prevent pesticides from getting into your gloves. **After using chemicals and before removing your gloves, rinse and clean them thoroughly.** After removing your gloves, wash your hands again. Make sure you have extra gloves on hand. When gloves wear out, throw them away and use another pair. If there is any question about whether the gloves leak, do not use them. There is a simple way to test gloves to see if they leak. Fill them with water and squeeze the top. If water comes out, replace the gloves.

Foot Protection

Toes and feet can be injured when working with pesticides. Boots offer protection when splash hazards are present. When working with pesticides, wear neoprene or nitrile boots to prevent exposure. Do not wear leather boots. Wear your pant legs outside of your boots to prevent pesticides from splashing inside. Personal protective equipment is available from safety supply

firms, mail order companies and many retail outlets. Head, face and eye shields, protective clothing and gloves for handling pesticides are frequently available from pesticide sellers.

Pesticide-Contaminated Clothing

Traditional work clothing readily absorbs pesticides and holds them close to the skin. This increases the risk of skin absorption of pesticides. 100 percent cotton clothing launders best. Even though this type of clothing can be decontaminated, you should use some form of suitably designed protective clothing.

Never launder pesticide-contaminated clothing with the family laundry. Change clothing after handling pesticides. Hang clothing outdoors if it is not laundered immediately.

Launder clothing daily when applying pesticides. All clothing worn while handling and applying pesticides should be considered contaminated and should be laundered before reuse.

Pre-Rinsing or Pre-Soaking Clothing

Always prerinse contaminated clothing. Presoak your clothing in a suitable container, agitate them in an automatic machine or spray/hose the garments outdoors. Be sure children and pets are not playing nearby. When using a tub or pail for prerinsing, dispose of the water preferably through the septic system. If possible, keep clothing contaminated with similar pesticides together so they can be presoaked together and then laundered together. One way to keep them in separate groups is to use plastic-lined boxes.

Laundering Pesticide-Contaminated Clothing

Launder pesticide-contaminated clothing separately from other household laundry. Pesticide residues can transfer from contaminated clothes to other clothing during washing. Wash a few contaminated garments at a time, using lots of water. Do not overload the machine. **Use hot water only.** Cold water is not effective in removing pesticides in the wash cycle. The water level should be at the highest setting and wash for a full cycle with a double rinse. Use dry detergent to clean dry formulations of pesticides. Use liquid detergent to clean liquid or EC formulations of pesticides.

More detergent is needed when garments have been treated with a soil/water repellent finish such as Scotch Guard or Zepel. Use 25 percent more detergent than recommended on the package, even if the water is hard. But do not use more than twice the recommended amount. The excess suds may restrict agitation and decrease chemical removal. The repellent finish must be reapplied after each laundering to give protection to the clothing.

Take care when adding fabric softeners and bleach. Fabric softeners do not affect either pesticide absorption or residue removal. **Bleach may be used, but not on clothing contaminated with ammonia fertilizer because ammonia reacts with bleach to form chlorine gas, which can be fatal.** Pesticides cannot be removed from some items. These items include leather boots, leather watchbands, the inner band on caps and some decorative items. **Once leather has been contaminated, it cannot be decontaminated.**

People who clean the pesticide equipment are pesticide handlers and they should wear the required personal protective equipment.

First Aid for Pesticide Poisoning

Step one in any poisoning emergency is to **call** an ambulance or doctor. The only exception is when you are all alone with the victim. Then you must see that he is breathing and that he is **out of the exposure** before leaving him to make your phone call. Always save the pesticide and the label for the doctor.

Poison on the Skin

The faster the poison is washed off the patient, the less injury will result.

Drench skin and clothing with water (shower, hose, faucet, pond).

Remove clothing.

Cleanse skin and hair thoroughly with soap and water. Detergents and commercial cleaners are better than soap.

Dry and wrap in a blanket.

Poison in the Eye

It is most important to wash the eye out as quickly but as gently as possible.

Hold eyelids open, wash eyes with a **gentle stream** of clean running water.

Continue washing for **15 minutes** or more.

Do not use chemicals or drugs in wash water. They may increase the extent of the injury.

Inhales Poisons (Dust, Vapors, Gases)

Symptoms: Sneezing, irritation of the nose and throat, nasal stuffiness, coughing, shortness of breath, and chest pains. If the victim is in an enclosed space, do not go in after him without an air-supplied respirator.

Carry patient (do not let him walk) to fresh air immediately.

Open all doors and windows.

Loosen all tight clothing.

Apply artificial respiration if breathing has stopped or is irregular.

Keep patient as quiet as possible.

If patient is convulsing watch his breathing and protect him from falling and striking his head.

Swallowed Poison

The most important choice you have to make when aiding a person who has swallowed a pesticide is **to vomit or not to vomit**.

The decision must be made quickly and accurately; the victim's life may depend on it. Usually it is best to get rid of the swallowed poison fast. **NEVER** induce vomiting if the victim is unconscious or is in convulsions. The victim could choke to death on the vomitus.

NEVER induce vomiting if the victim has swallowed a corrosive poison. Find out what poison the person has ingested. A corrosive poison is a strong acid or alkali such as dinoseb. The victim will complain of severe pain and have signs of severe mouth and throat burns. A corrosive poison will burn the throat and mouth as severely coming up as it did going down.

Pesticides which come in liquid formulations are dissolved in petroleum products. The words "emulsifiable concentrate" or "solution" on the pesticide label are signals NOT to induce vomiting in the poison victim if he has swallowed the concentrates. Concentrated petroleum products (like corrosive poisons) cause severe burns and they will burn as severely when vomited up. If he has swallowed a dilute form of these formulations, he should be forced to vomit immediately.

California Code of Regulations

1983. Handling, Use, and Storage of Pesticides

- (a) Each container in which any pesticide is stored, carried or transported shall be adequately labeled in accordance with the provisions of Article 1 and 5, Chapter 2, Division 7 of the Food and Agricultural Code....
- (b) Service kits which contain any pesticide or preparation thereof shall be handled with extreme caution and in no case shall such a kit be left where children or other unauthorized person might remove the container.
- (c) When any pesticide or preparation thereof is carried on a truck or other vehicle, a suitable storage space shall be provided thereon. Under no circumstances shall such storage be left either unlocked or unattended when containing any pesticide or preparation thereof.
- (d) Where there is danger of food or drug contamination, all food or drug commodities and all utensils or equipment used in the preparation of food or drugs shall be adequately covered to insure against contamination by pesticidal material unless the contamination will be dissipated or otherwise removed prior to the time the food or drugs are consumed or the utensils or equipment used.
- (e) No rodenticide and avicide shall be used in such manner as to be readily accessible to children or pets.
- (f) All rodenticides and avicides shall be removed from readily accessible places upon termination of the particular service.
- (g) Under no circumstances shall oil base insecticidal material be used in or near open flames or active heaters.
- (h) Tracking powders shall be used only at level or in such places as warrant their safe use.
- (i) When a covered or uncovered bait station is used for any pesticide the bait station shall be adequately marked with the signal word or symbols required on the original pesticide label, the generic name of the pesticide and the name, address and telephone number of the structural pest control company. A building which is vacated, posted, locked and in the care, custody and control of the registered company shall be considered the bait station.

6600. General Standards of Care.

Each person performing pest control shall:

- (a) Use only pest control equipment which is in good repair and safe to operate.
- (b) Perform all pest control in a **careful and effective** manner.
- (c) Use only methods and equipment suitable to insure proper application of pesticides.
- (d) Perform all pest control under climatic conditions suitable to insure proper application of pesticides.
- (e) Exercise reasonable precautions to avoid contamination of the environment.

6601. General Application of Standards.

- (a) Whenever pesticide product labeling requires the use of personal protective equipment or specifies other restrictions or procedures be followed, the application of that labeling requirement to an owner or operator of the property to be treated, their families, and others, shall be consistent with any applicable standards for employees in Subchapter 3, commencing with Section 6700.

(b) It is not the intent of these regulations to require separate or duplicate equipment or facilities. Equipment and facilities provided for compliance with the requirements of other agencies may also be used for complying with these regulations provided the equipment and facilities meet the requirements of these regulations.

6602. Availability of Labeling.

A copy of the registered labeling that allows the manner in which the pesticide is being used **shall** be available at each use site.

6610. Backflow Prevention.

Each service rig and piece of application equipment that handles pesticides and draws water from an outside source shall be equipped with an air-gap separation, reduced pressure principle backflow prevention device or double-check valve assembly. Backflow protection must be acceptable to both the water purveyor and the local health department.

6612. Age.

No person shall permit a minor under **18** years of age to mix or load a pesticide which, in any use situation, use of any of the following is required by labeling or regulation:

- (a) air supplied respiratory protection,
- (b) closed systems,
- (c) full-body, chemical-resistant protective clothing.

6614. Protection of Persons, Animals, and Property.

(a) An applicator prior to and while applying a pesticide shall evaluate the equipment to be used, meteorological conditions, the property to be treated, and surrounding properties to determine the likelihood of harm or damage.

(b) Notwithstanding that substantial drift would be prevented, no pesticide application shall be made or continued when:

- (1) There is a reasonable possibility of contamination of the bodies or clothing of persons not involved in the application process;
- (2) There is a reasonable possibility of damage to nontarget crops, animals, or other public or private property; or
- (3) There is a reasonable possibility of contamination of nontarget public or private property, including the creation of a health hazard, preventing normal use of such property. In determining a health hazard, the amount and toxicity of the pesticide, the type and uses of the property and related factors shall be considered.

6616. Consent to Apply.

No person shall directly discharge a pesticide onto a property without the consent of the owner or operator of the property.

6618. Notice of Applications.

(a) Each person performing pest control shall give notice to the operator of the property to be treated before any pesticide is applied.

- (1) The notice shall be in a manner the person can understand and include:

- (A) The date of the scheduled application;
 - (B) The identity of the pesticide to be applied by brand or common chemical name; and
 - (C) Precautions to be observed as printed on the pesticide product labeling or included in applicable laws or regulations.
- (2) If the scheduled application is for the commercial or research production of an agricultural plant commodity the notice shall also include:
- (A) The time of the scheduled application;
 - (B) The location and description of the area to be treated;
 - (C) The applicable restricted entry interval;
 - (D) The product name, EPA registration number, and active ingredient; and
 - (E) If the pesticide product labeling requires the posting of treated fields.
- (b) The operator of property for the commercial or research production of an agricultural plant commodity shall assure that notice is given to persons, as specified below, except for the persons who applied or supervised the application for which the notice is intended. For the purposes of this subsection, persons include employees of the operator of the property and any contractor hired by the operator of the property who may walk within 1/4 mile of the treated field.
- (1) The notice shall be given:
 - (A) Prior to the application, to persons who are in the field or likely to enter the field during the application; and
 - (B) Before the scheduled entry, to persons who may enter the field during the restricted entry interval.
 - (2) The notice shall be given to any licensed pest control business or licensed labor contractor hired by the operator of the property that may have employees on or within 1/4 mile of the field during the application or the restricted entry interval. The pest control business or labor contractor receiving notice shall give notice to his or her employees. In lieu of giving notice to the licensed pest control business or the licensed labor contractor, the operator of the property may give notice directly to the employees of a labor contractor or pest control business to meet the requirements of this subsection (b).
 - (3) The notice shall be in a manner the person can understand and include:
 - (A) The location and description of the treated area;
 - (B) The time during which entry is restricted; and
 - (C) Instructions not to enter the treated field, except as provided in Section 6770, until the restricted entry interval has expired.
 - (4) The notice specified in this subsection (b) is not required when a field is posted as specified in Section 6776 unless the pesticide product labeling requires both oral notification to field workers and the posting of treated fields.
- (c) The operator of property for purposes other than the commercial or research production of an agricultural plant commodity, shall assure that notice is given to all persons who are on the treated property, or likely to enter during the application or the period of time that any restrictions on entry are in effect, except for the persons who made or supervised the application for which the notice is intended.
- (1) **The notice shall be in a manner the person can understand and include:**
 - (A) The date of the application;
 - (B) The identity of the pesticide by brand or common chemical name; and
 - (C) Precautions to be observed as printed on the pesticide product labeling or included in

applicable laws or regulations.

(2) Compliance by licensed Structural Pest Control Operators with the notice requirements of Section 8538 of the Business and Professions Code meets the requirements of this Section.

(3) Compliance by public agencies with the notice or barrier requirements of Section 12978 of the Food and Agricultural Code meets the notice requirements of this Section.

6619. Pesticide Application Completion Notice.

(a) In addition to the notice required pursuant to Section 6618, an agricultural pest control business applying pesticides for the production of an agricultural commodity shall give notice to the operator of the property treated (or the operator's designated employee), within 24 hours of completion of the pesticide application. The operator's designated employee must, at minimum, have the authority and ability to reschedule or stop activities involving field workers performing cultural practices (e.g., irrigating, thinning, tree-limb propping, weeding, harvesting). This notice shall include the following information:

- (1) The location of the property, including the site identification number, and acreage treated;
- (2) The pesticide(s) applied;
- (3) The date and hour the application was completed; and
- (4) The applicable reentry and preharvest intervals, unless a copy of a written recommendation made by a licensed agricultural pest control adviser, properly completed, were given to the operator of the property treated.

(b) If the operator of the property (or the operator's designated employee) will not be available to receive the notice within the 24-hour period, the operator shall identify in writing, the method by which the agricultural pest control business may provide notification. The method may be, but is not limited to, any of the following:

- (1) Post or leave the notice in a designated location on the operator's property;
- (2) Record the notification on a phone recorder; or
- (3) Send the notice over a facsimile machine.

(c) The operator of the property treated shall maintain a record of the application completion notice(s) he or she receives by site, and a copy of the written notification method provided to each agricultural pest control business, if one is required.

(d) The agricultural pest control business shall retain a copy of the written notification method received from the operator of the property, if the business received one. The business shall also maintain a written record which documents the following:

- (1) The name of the operator of the property treated;
- (2) The location of the property, including the site identification number;
- (3) The date and time the notice was given; and
- (4) The method of notification, including the name of the person notified, if a person was notified.

(e) The records and written notification method required pursuant to this Section shall be retained for two years and made promptly available to the director or commissioner upon request.

6630. Equipment Identification.

Each person engaged for hire in the business of pest control shall keep each ground rig, service rig, and similar equipment used for mixing or applying pesticides conspicuously and legibly marked with either the business' name, or with "Licensed Pest Control Operator," "Fumigation

Division," "Licensed Fumigator," or substantially similar wording and the pest control operator license number of the person or firm. The markings shall be large enough to be readable at a distance of **25 feet**.

6670. Container Control.

Pesticides, emptied containers or parts thereof, or equipment that holds or has held a pesticide, **shall not** be stored, handled, emptied, disposed of, or left unattended in such a manner or at any place where they may present a hazard to persons, animals (including bees), food, feed, crops or property. The commissioner may take possession of such unattended pesticides or emptied containers to abate such hazard.

6672. Delivery of Pesticide Containers.

(a) No person shall deliver a container that holds, or has held, a pesticide to a property unless he stores it in an enclosure or closure complying with the requirements of this Section or delivers it to a person in charge of the property or his agent, or a pest control operator or his employee. The person receiving the container shall control access to it in accordance with this Section.

(b) Each person who controls the use of any property or premises is responsible for all containers or equipment on the property that hold, or have held, a pesticide. Unless all such containers are under his personal control so as to avoid contact by unauthorized persons, he shall:

(1) Provide a person responsible to him to maintain such control over the containers at all times; or

(2) Store all such containers in a locked enclosure, or in the case of liquid pesticides in a container larger than 55 gallons in capacity, the container shall have a locked closure. Either shall be adequate to prevent unauthorized persons from gaining access to any of the material.

6674. Posting of Pesticide Storage Areas.

Signs visible from any direction of probable approach shall be posted around all storage areas where containers that hold, or have held, pesticides required to be labeled with the signal words "warning" or "danger" are stored. Each sign shall be of such size that it is readable at a distance of **25 feet** and be substantially as follows:

DANGER

POISON STORAGE AREA

ALL UNAUTHORIZED PERSONS KEEP OUT

KEEP DOOR LOCKED WHEN NOT IN USE

The notice shall be repeated in an appropriate language other than English when it may reasonably be anticipated that persons who do not understand the English language will come to the enclosure.

6676. Container Requirements.

Except as provided in the Food and Agricultural Code pertaining to service containers, any container that holds, or has held, any pesticide, when stored or transported, **shall carry the registrant's label**. All lids or closures shall be securely tightened except when the procedure described in Section 6684 has been followed. This Section shall not apply to measuring devices that are not used to store or transport a pesticide.

6678. Service Container Labeling.

Service containers, other than those used by a person engaged in the business of farming when the containers are used on the property the person is farming, **shall be labeled** with:

- (a) The name and address of the person or firm responsible for the container;
- (b) The identity of the economic poison in the container; and
- (c) The word "Danger," "Warning," or "Caution," in accordance with the label on the original container.

6680. Prohibited Containers for Pesticides.

In no case shall a pesticide be placed or kept in any container of a type commonly used for food, drink or household products.

6682. Transportation.

- (a) Pesticides **shall not** be transported in the same compartment with persons, food or feed.
- (b) Pesticide containers **shall be** secured to vehicles during transportation in a manner that will prevent spillage onto the vehicle or off the vehicle. Paper, cardboard, and similar containers shall be covered when necessary to protect them from moisture.

6684. Rinse and Drain Procedures.

- (a) Except for containers to be returned to the registrant, each emptied container that has held **less than 28 gallons** of a liquid pesticide that is diluted for use shall be rinsed and drained by the user at time of use as follows:
- (b)(1) Use the following amount of water or other designated spray carrier for each rinse.

<u>Size of container</u>	<u>Amount of rinse medium</u>
Less than 5 gallons	1/4 container volume
5 gallons or over	1/5 container volume

- (2) Place required minimum amount of rinse medium in the container, replace closure securely, and agitate.
- (3) Drain rinse solution from container into tank mix. Allow container to drain **30 seconds** after normal emptying.
- (4) Repeat (2) and (3) above a minimum of **two times** so as to provide a total of three rinses; or
- (c)(1) Invert the emptied container over a nozzle located in the opening of the mix tank which is capable of rinsing all inner surfaces of the container.
- (2) Activate the rinse nozzle allowing the rinse solution to drain into the tank. The rinse shall continue until the rinse solution appears clear and a minimum of one-half of the container volume of rinse medium has been used. A minimum of **15 pounds pressure per square inch** shall be used for rinsing; or
- (d) Other rinse methods, at least equal in effectiveness to the above, approved by the director.

6686. Exemptions.

- (a) Sections 6672, 6674, 6682, and 6684 shall not apply to containers that hold or have held pesticides packaged, labeled, and used for home use when in the possession of a householder on his property.

(b) Sections 6670 and 6672(b) shall not apply to exempt materials specified in Section 6402 except where the commissioner, or the director in any county where there is no commissioner, determines that hazard to public health and safety exists requiring the control specified in sections 6670 and 6672(b).

(c) Section 6684 shall not apply to outer shipping containers that are not contaminated with a pesticide.

(d) This article shall not apply to sanitizers, disinfectants, or medical sterilants.

6702. Employer-Employee Responsibilities.

(a) The employer shall comply with each regulation in this Subchapter which is applicable to the employer's action or conduct.

(b) The employer:

(1) Is responsible for knowing about applicable safe use requirements specified in regulations and on the pesticide product labeling;

(2) Shall inform the employee, in a language the employee understands, of the specific pesticide being used, pesticide safety hazards, the personal protective equipment and other equipment to be used, work procedures to be followed, and pesticide safety regulations applicable to all activities they may perform;

(3) Shall supervise employees to assure that safe work practices, including all applicable regulations and pesticide product labeling requirements are complied with;

(4) Has the duty to provide a safe work place for employees and require employees to follow safe work practices; and

(5) Shall take all reasonable measures to assure that employees handle and use pesticides in accordance with the requirements of law, regulations, and pesticide product labeling requirements.

(c) **Employees shall utilize** the personal protective equipment and other safety equipment required by pesticide product labeling or specified in this subchapter that has been provided by the employer at the work site in a condition that will provide the safety or protection intended by the equipment.

6726. Emergency Medical Care.

(a) Emergency medical care for employees handling pesticides shall be planned for in advance. The employer shall locate a facility where emergency medical care is available for employees who will be handling pesticides.

(b) Employees shall be informed of the name and location of a facility where emergency medical care is available. The employer shall **post** in a prominent place at the work site, or work vehicle if there is no designated work site, the name, address and telephone number of a facility able to provide emergency medical care whenever employees will be handling pesticides and, if the identified facility is not reasonably accessible from that work location, procedures to be followed to obtain emergency medical care.

(c) When there is reasonable grounds to suspect that an employee has a pesticide illness, or when an exposure to a pesticide has occurred that might reasonably be expected to lead to an employee's illness, the employer shall ensure that the employee is taken to a physician immediately.

6732. Change Area.

For any employee who regularly handles pesticides with the signal word "DANGER" or "WARNING", and for all employees who handle any pesticides for the commercial or research production of an agricultural plant commodity, the employer shall assure that there is, at the place where employees end their exposure period and remove their personal protective equipment, an area where employees may change clothes and wash themselves. Clean towels, soap, and sufficient water shall be available to allow for thorough washing. The employer shall provide a clean, pesticide-free place where employees may store any personal clothing not in use while at work handling pesticides.

6736. Coveralls.

(a) The employer shall provide coveralls for each employee who handles any pesticide with the signal word "DANGER" or "WARNING" on the label except as provided in 6738(I).

(b) The employer shall assure that:

(1) Employees start each work day wearing coveralls whenever they handle pesticides with the signal word "DANGER" or "WARNING";

(2) Employees wear coveralls whenever they handle pesticides with the signal word "DANGER" or "WARNING" except as provided in 6738(I);

(3) Employees change out of their coveralls and wash at the end of the day;

(4) Potentially contaminated coveralls removed at the worksite or headquarters are not taken home by employees; and

(5) Employees whose work day does not involve return to the employer's headquarters, remove and store potentially contaminated coveralls in a sealable container outside of their own living quarters for later return to the employer.

(c) This section does not apply to coveralls using fumigants unless the pesticide product labeling expressly requires the use of coveralls.

6738. Personal Protective Equipment.

(a) The employer shall:

(1) Provide all required personal protective equipment, provide for its daily inspection and cleaning (according to pesticide labeling instructions or, absent any instructions, washed in detergent and hot water), and repair or replace any worn, damaged, or heavily contaminated personal protective equipment. Leather gloves previously used to apply only aluminum phosphide or magnesium phosphide pesticides and which have been aerated for 12 hours or more shall be considered cleaned;

(2) Assure that all clean personal protective equipment, when not in use, is kept separate from personal clothing and in a pesticide free, specifically designated place;

(3) Assure that appropriate measures are taken to prevent heat related illness when necessary;

(4) Assure that personal protective equipment is used correctly for its intended purpose;

(5) Discard any absorbent materials that have been drenched or heavily contaminated with a pesticide with the signal word "DANGER" or "WARNING";

(6) Keep and wash potentially contaminated personal protective equipment separately from other clothing or laundry;

(7) Assure that all clean personal protective equipment is either dried thoroughly before being stored or is put in a well ventilated place to dry;

- (8) Assure that personal protective equipment remains the property of the employer and that pesticide handlers are not allowed or directed to take potentially contaminated personal protective equipment into their homes;
- (9) Assure that any person or firm assigned or hired to clean or repair potentially contaminated personal protective equipment is protected and informed in accordance with the requirements of Section 6744 (Equipment Maintenance).

(b) The employer shall assure that:

- (1) Employees wear protective eyewear when required by pesticide product labeling (except as expressly provided in this section) or when employees are engaged in:
 - (A) Mixing or loading, except as provided in 6738(i);
 - (B) Adjusting, cleaning, or repairing mixing, loading, or application equipment that contains pesticide in hoppers, tanks, or lines;
 - (C) Application by hand or using hand held equipment, except when:
 - 1. Applying vertebrate pest control baits that are placed without being propelled from application equipment;
 - 2. Applying solid fumigants (including aluminum phosphide, magnesium phosphide, and smoke cartridges) to vertebrate burrows;
 - 3. Baiting insect monitoring traps; or
 - 4. Applying non-insecticidal lures.
 - (D) Ground application using vehicle mounted or towed equipment, except when:
 - 1. Injecting or incorporating pesticides into soil;
 - 2. Spray nozzles are located below the employee and the nozzles are directed downward; or
 - 3. Working in an enclosed cab; or
 - (E) Flagging, except when the flagger is in an enclosed cab.

(c) The employer shall assure that:

- (1) Gloves are worn when required by the pesticide product labeling (except as expressly provided in this section) or (unless the pesticide product labeling specifies that gloves must not be worn), when employees are engaged in:
 - (A) Mixing or loading, except as provided in 6738(i);
 - (B) Adjusting, cleaning or repairing contaminated mixing, loading, or application equipment; and
 - (C) Application by hand or using hand-held equipment, except when applying vertebrate pest control baits using long handled implements that avoid actual hand contact with the bait or potentially contaminated areas of equipment.
- (2) If a specific type of glove is not specified on product labeling for the pesticide being handled, gloves made of rubber, neoprene, or other chemical resistant material that provides equivalent or better protection are used. Gloves or glove linings of leather, cotton, or other absorbent materials shall not be worn unless expressly permitted by pesticide product labeling. If chemical resistant gloves with sufficient durability and suppleness are not available, leather gloves may be worn over chemical resistant glove liners. Once leather gloves have been used for this purpose, they shall not be worn in any other situation.

(d) The employer shall assure that:

- (1) When chemical resistant footwear is specified by the pesticide product labeling, one of the

following types of footwear is worn:

- (A) Chemical resistant shoes;
- (B) Chemical resistant boots; or,
- (C) Chemical resistant coverings worn over boots or shoes.

(2) For aircraft operation, chemical resistant footwear need not be worn.

(e) The employer shall assure that when chemical resistant headgear is specified by the pesticide product labeling, either a chemical resistant hood or a chemical resistant hat with a wide brim is worn. For aircraft operation, a helmet may be substituted for chemical resistant headgear.

(f) The employer shall assure that when a chemical resistant apron is specified by the pesticide product labeling, a garment that covers the front of the body from mid-chest to the knees is worn.

(g) The employer shall assure that:

(1) When pesticide product labeling or regulations specify a chemical resistant suit, waterproof or impervious pants and coat or a rain suit, a chemical resistant suit that covers the torso, head, arms, and legs is worn.

(2) If the ambient temperature exceeds 80oF during daylight hours or 85oF during nighttime hours (sunset to sunrise) pesticides requiring a chemical resistant suit are not handled by employees unless they are handled pursuant to exceptions and substitutions permitted in (i) or employees use cooled chemical resistant suits or other control methods to maintain an effective working environment at or below 80oF during daylight hours or 85oF during nighttime hours (sunset to sunrise).

(h) The employer shall assure that:

(1) Employees use approved respiratory protective equipment when pesticide product labeling or regulations require respiratory protection or when respiratory protection is needed to maintain employee exposure below an applicable exposure standard found in Title 8, California Code of Regulations, Section 5155.

(2) Respiratory protection required by these regulations or labeling is currently approved by the National Institute for Occupational Safety and Health (NIOSH) and/or the Mine Safety and Health Administration (MSHA) for the specific chemical and exposure condition. Proper selection of respirators shall be made following pesticide product labeling, or absent specific instruction, according to the guidance of National Standard Practices for Respiratory Protection: Z88.2-1980, or the American National Standard Practices of Respiratory Protection During Fumigation: Z88.3-1983.

(3) Written operating procedures for selecting, fitting, cleaning and sanitizing, inspecting and maintaining respiratory protective equipment are adopted.

(4) Employees with facial hair that prevents an adequate seal are not assigned work requiring them to wear a respirator unless they are provided a respirator that does not rely on a face-to-face piece seal for proper operation.

(5) Respirators maintained for stand-by or emergency use are inspected monthly or before use if occasions for possible use are more than one month apart. A record of the most recent inspection shall be maintained on the respirator or its storage container.

(6)(A) Employees are informed, prior to beginning work, that certain medical conditions may interfere with wearing a respirator while engaged in potential pesticide exposure situations. A statement in substantially the following form shall be on file for each employee assigned to work that requires wearing a respirator.

To the best of my knowledge, I have _____, have no _____ medical conditions which would interfere with wearing a respirator while engaged in potential pesticide exposure situations. I understand that heart disease, high blood pressure, lung disease or presence of a perforated ear drum are examples of conditions that require specific medical evaluation by a physician before safe use of a respirator can be determined.

Name

Date

(B) If an employee checks that he or she has such a condition, a physician's report of evaluation and approval for respirator use is on file before work requiring respirator use is allowed. The following or substantially similar statement from a physician is acceptable.

On _____, I examined _____.
Date Patient's name

At this time there is no medical contraindication to the employee named above wearing a respirator to allow working in potential pesticide exposure environments. (Other comments)

Physician

Date

(7) Compressed air used in Self Contained Breathing Apparatus (SCBA) or for air-line type respirators meets or exceeds the requirements for Grade D breathing air as described in the Compressed Gas Association Commodity Specification G-7.1 (ANSI Z86.1-1973).

(8) When air purifying-type respirators are required for protection against pesticides, the air purifying elements or entire respirator, if disposable, are replaced according to pesticide product labeling directions or respiratory equipment manufacturer recommendations, whichever provides for the most frequent replacement, or, absent any other instructions on service life, at the end of each day's work period. At the first indication of odor, taste, or irritation, the wearer leaves the area and checks the respirator for fit or function concerns or air purifying element replacement.

(i) The following exceptions and substitutions to personal protective equipment required by pesticide product labeling or regulations are permitted:

(1) Persons using a closed system to handle pesticide products with the signal word "DANGER" or "WARNING" may substitute coveralls, chemical resistant gloves, and a chemical resistant apron for personal protective equipment required by pesticide product labeling;

(2) Persons using a closed system to handle pesticide products with the signal word "CAUTION" may substitute work clothing for personal protective equipment required by pesticide product labeling;

(3) Persons using a closed system that operates under positive pressure shall wear protective eyewear in addition to the personal protective equipment listed in (1) or (2). Persons using any closed system shall have all personal protective equipment required by pesticide product labeling immediately available for use in an emergency;

(4) Persons properly mixing pesticides packaged in water soluble packets are considered to be using a closed (mixing) system for the purposes of this subsection;

(5) Persons occupying an enclosed cab (including cockpit) may substitute work clothing for personal protective equipment required by pesticide product labeling. If respiratory protection is required it must be worn, except in an enclosed cockpit;

(6) Persons occupying an enclosed cab acceptable for respiratory protection may substitute work clothing for personal protective equipment required by pesticide product labeling;

(7) Persons working in an enclosed cab, as specified in (5) and (6), other than an aircraft, shall have all personal protective equipment required by pesticide product labeling immediately available and stored in a chemical resistant container, such as a plastic bag. Labeling-required personal protective equipment shall be worn if it is necessary to work outside the cab and contact pesticide treated surfaces in the treated area. Once personal protective equipment is worn in the treated area, it shall be removed and stored in a chemical resistant container, such as a plastic bag, before reentering the cab;

(8) A chemical resistant suit may be substituted for coveralls and/or a chemical resistant apron; and

(9) Pest control aircraft pilots are not required to wear gloves during operation but gloves shall be worn by any person entering or exiting an aircraft contaminated with pesticide residues.

While in the cockpit, gloves shall be carried in a chemical resistant container, such as a plastic bag.

6242. Warning or Caution Statement.

Warning or caution statements, which are necessary, and if complied with, adequate to prevent injury to living man and useful vertebrate animals, useful vegetation, and useful invertebrate animals, must appear on the label in a place sufficiently prominent to warn the user, and must state clearly and in nontechnical language the particular hazard involved in the use of the pesticide, e.g., ingestion, skin absorption, inhalation, flammability or explosion, and the precautions to be taken to avoid accident, injury, or damage.

(a) The label of every pesticide shall bear warnings or cautions which are necessary for the protection of the public, including the statement, **"Keep out of reach of children,"** and a signal word such as "Danger," "Warning," or "Caution" as the director may prescribe, on the front panel or that part of the label displayed under customary conditions of purchase; however, the director may permit reasonable variations on the placement of that part of the required warnings and cautions other than the statement, "Keep out of the reach of children," and the required signal word, if in his opinion such variations would not be injurious to the public. If a pesticide is marketed in channels of trade where the likelihood of contact with children is extremely remote, or if the nature of the product is such that it is likely to be used on infants or small children without causing injury in under reasonably foreseeable conditions, the director may waive the requirement of the statement, "Keep out of reach of children," if in his opinion such a statement is not necessary to prevent injury to the public. The director may permit a statement such as "Keep away from infants and small children" in lieu of the statement "Keep out of reach of children," if the director determined that such a variation would not be injurious to the public.

(b) The label of every pesticide which is highly toxic to man shall bear the word "Danger" along with the word "Poison" in red on contrasting background in immediate proximity to the skull and crossbones, and an antidote statement including directions to call a physician immediately on the

front panel or that part of the label displayed under customary conditions of purchase; however, the director may permit reasonable variations in the placement of the antidote statement if some reference such as "See antidote statement on back panel" appears on the front panel near the word "Poison" and the skull and crossbones.

BUSINESS AND PROFESSIONS CODE

Section 8516

(a) This section, and Section 8519, apply only to wood destroying pests or organisms.

(b) No registered company or licensee shall commence work on a contract, or sign, issue, or deliver any documents expressing an opinion or statement relating to the absence or presence of wood destroying pests or organisms until an inspection has been made by a licensed Branch 3 field representative or operator. The address of each property inspected or upon which work is completed shall be reported on a form prescribed by the board and shall be filed with the board no later than 10 business days after the commencement of an inspection or upon completed work.

Every property inspected pursuant to this subdivision or Section 8518 shall be assessed a filing fee pursuant to Section 8674.

Failure of a registered company to report and file with the board the address of any property inspected or work completed pursuant to Section 8518 or this section is grounds for disciplinary action and shall subject the registered company to a fine of not more than two thousand five hundred dollars (\$2,500).

A written inspection report conforming to this section and a form approved by the board shall be prepared and delivered to the person requesting the inspection or to the person's designated agent within 10 business days of the inspection, except that an inspection report prepared for use by an attorney for litigation purposes is not required to be reported to the board. The report shall be delivered before work is commenced on any property. The registered company shall retain for three years all original inspection reports, field notes, and activity forms.

Reports shall be made available for inspection and reproduction to the executive officer of the board or his or her duly authorized representative during business hours. Original inspection reports or copies thereof shall be submitted to the board upon request within two business days. The following shall be set forth in the report:

(1) The date of the inspection and the name of the licensed field representative or operator making the inspection.

(2) The name and address of the person or firm ordering the report.

(3) The name and address of any person who is a party of interest.

(4) The address or location of the property.

(5) A general description of the building or premises inspected.

(6) A foundation diagram or sketch of the structure or structures or portions of the structure or structures inspected, indicating thereon the approximate location of any infested or infected areas evident, and the parts of the structure where conditions that would ordinarily subject those parts to attack by wood destroying pests or organisms exist.

(7) Information regarding the substructure, foundation walls and footing, porches, patios and steps, air vents, abutments, attic spaces, roof framing that includes the eaves, rafters, fascias, exposed timbers, exposed sheathing, ceiling joists, and attic walls, or other parts subject to attack by wood destroying pests or organisms. Conditions usually deemed likely to lead to

infestation or infection, such as earth-wood contacts, excessive cellulose debris, faulty grade levels, excessive moisture conditions, evidence of roof leaks, and insufficient ventilation are to be reported.

(8) One of the following statements, as appropriate, printed in bold type:

(A) The exterior surface of the roof was not inspected. If you want the water tightness of the roof determined, you should contact a roofing contractor who is licensed by the Contractors' State License Board.

(B) The exterior surface of the roof was inspected to determine whether or not wood destroying pests or organisms are present.

(9) Indication or description of any areas that are inaccessible or not inspected with recommendation for further inspection if practicable. If, after the report has been made in compliance with this section, authority is given later to open inaccessible areas, a supplemental report on conditions in these areas shall be made.

(10) Recommendations for corrective measures.

(11) Information regarding the pesticide or pesticides to be used for their control as set forth in subdivision (a) of Section 8538.

(12) The inspection report shall clearly disclose that if requested by the person ordering the original, a reinspection of the structure will be performed if an estimate or bid for making repairs was given with the original inspection report, or thereafter.

(13) The inspection report shall contain the following statement, printed in boldface type: "NOTICE: Reports on this structure prepared by various registered companies should list the same findings (i.e. termite infestations, termite damage, fungus damage, etc). However, recommendations to correct these findings may vary from company to company. You have the right to seek a second opinion from another company."

An estimate or bid for repairs shall be given separately allocating the costs to perform each and every recommendation for corrective measures as specified in subdivision (c) with the original inspection report if the person who ordered the original inspection reports so requests, and if the registered company is regularly in the business of performing corrective measures...

Section 8538

(a) A registered structural pest control company shall provide the owner, or owner's agent, and tenant of the premises for which the work is to be done with clear written notice which contains the following statements and information using words with common and everyday meaning:

(1) The pest to be controlled.

(2) The pesticide or pesticides proposed to be used, and the active ingredient or ingredients.

(3) "State law requires that you be given the following information: **CAUTION--PESTICIDES ARE TOXIC CHEMICALS.** Structural Pest Control Companies are registered and regulated by the Structural Pest Control Board, and apply pesticides which are registered and approved for use by the California Department of Pesticide Regulation and the United States Environmental Protection Agency. Registration is granted when the state finds that based on existing scientific evidence there are no appreciable risks if proper use conditions are followed or that the risks are outweighed by the benefits. The degree of risk depends upon the degree of exposure, so exposure should be minimized." "If within 24 hours following application you experience symptoms similar to common seasonal illness comparable to the flu, contact your physician or poison control center (telephone number) and your pest control company immediately." (This statement shall be

modified to include any other symptoms of overexposure which are not typical of influenza.)
"For further information, contact any of the following: Your Pest Control Company (telephone number); for Health Questions--the County Health Department (telephone number); for Application

Information--the County Agricultural Commissioner (telephone number) and for Regulatory Information--the Structural Pest Control Board (telephone number and address)."

(4) If a contract for periodic pest control has been executed, the frequency with which the treatment is to be done.

(b) In the case of Branch 1 applications, the notice, as prescribed by subdivision (a), shall be provided at least 48 hours prior to application unless fumigation follows inspection by less than 48 hours. In the case of Branch 2 or Branch 3 registered company applications, the notice, as prescribed by subdivision (a) **shall be provided no later than prior to application. In either case, the notice shall be given to the owner, or owner's agent, and tenant, if there is a tenant, in at least one of the following ways:**

(1) First-class mail.

(2) Posting in a conspicuous place on the real property.

(3) Personal delivery.

If the building is commercial or industrial, a notice shall be posted in a conspicuous place, unless the owner or owner's agent objects, in addition to any other notification required by this section. The notice shall only be required to be provided at the time of the initial treatment if a contract for periodic service has been executed. **If the pesticide to be used is changed**, another notice shall be required to be provided in the manner previously set forth herein.

(c) Any person or licensee who, or registered company which, violates any provision of this section is guilty of a misdemeanor and is punishable as set forth in Section 8553.

Test Your Knowledge

Q. What is the first thing you should do when you detect the presence of a pest that you think you may need to control?

A. Identify the pest to be sure you know exactly what the problem is.

Q. How can pest identification help you develop a good pest control strategy?

A. Identification of the pest allows you to determine basic information about it, including its life cycle and the time that it is most susceptible to being controlled.

Q. Explain the differences between continuous pests, sporadic pests, and potential pests.

A. Continuous pests are nearly always present and require regular control; sporadic pests are migratory, cyclical, or other occasional pests that require control once in a while, but not regularly; potential pests are organisms that are not pests under normal conditions, but can become pests and require control in certain circumstances.

Q. Explain what is meant by prevention, suppression, and eradication of pests.

A. Prevention is keeping a pest from becoming a problem; suppression is reducing pest numbers or damage to an acceptable level; eradication is destroying an entire pest population.

Q. What is a threshold? Why should you consider thresholds when you develop a pest control strategy?

A. Thresholds are the levels of pest populations at which you must take pest control action to prevent unacceptable damage or injury. Using threshold information can improve your pest control strategy by helping you decide about when to begin control tactics.

Q. Describe pest monitoring and explain how it can be important to pest control strategy.

A. Monitoring is checking or scouting for pests in an area to determine what pests are present, how many of each kind are in the area, and how much damage they are causing. Monitoring is important to many pest control strategies because it helps determine if the threshold has been reached and whether control measures have been effective.

Q. Define "integrated pest management" (IPM) and list several possible control tactics that may be used in an IPM strategy.

A. Integrated pest management is several pest control tactics combined into a single plan to reduce pests and their damage to an acceptable level. Pest control tactics may include: host resistance, biological, cultural, mechanical or chemical (pesticide) controls, and sanitation.

Q. You applied a pesticide, but it did not control the pest. Name three reasons why your control effort might have failed.

A. The failure of the pesticide might have been caused by misidentifying the pest, pest resistance, choosing the wrong pesticide, applying the wrong amount, or applying the pesticide incorrectly.

Q. What can you do to keep the pests you are trying to control from becoming resistant to

the pesticides you use?

A. Pest resistance can be reduced by using integrated pest management and rotating the types of pesticides used.

Q. Explain the differences between the terms "label" and "labeling."

A. The label is the information printed on or attached to the pesticide container. Labeling includes the label, and all other product information received from the manufacturer when you buy it.

Q. What do the words "Restricted Use Pesticide" tell you about the pesticide product?

A. "Restricted Use Pesticide" means that the product has been shown to be likely to harm people or the environment if it is not used correctly. It may be purchased and used only by certified applicators and those under their direct supervision.

Q. Where would you look to find out whether a pesticide is classified as Restricted Use?

A. If a pesticide is classified as Restricted Use, the words "Restricted Use Pesticide" will appear in a box on the front panel of the pesticide label.

Q. Explain the differences between chemical name, common name, and brand name. Which of these terms should you use to most accurately identify a pesticide product?

A. The chemical name is a complex name that identifies the chemical components and structure of the pesticide. A common name is a shorter name that EPA recognizes as a substitute for the chemical name of a product. A brand name is the name, usually a trademark, used by a chemical company to identify a pesticide product. The common name (or the chemical name, if no common name is given) is the most accurate and useful way to identify a pesticide product.

Q. Name and explain the meaning of the signal words and symbols you may see on a pesticide product.

A. "Caution" indicates that the pesticide product is slightly toxic or relatively nontoxic. "Warning" indicates that the pesticide product is moderately toxic. "Danger" indicates that the pesticide product is highly toxic. "Poison" and the skull and crossbones indicate that the pesticide product is highly toxic as a poison, rather than as a skin or eye irritant.

Q. Can you use the signal word on a pesticide label to judge the likelihood of suffering acute, delayed, or allergic effects if you are overexposed to the product? Explain.

A. Signal words and symbols indicate the likelihood that you will experience acute harmful effects if you are overexposed. Signal words do not tell you anything about the risks of delayed harmful effects or allergic effects.

Q. What types of hazard statements should you look for in the pesticide labeling?

A. You should look for precautions about hazards to humans (and domestic animals), environmental hazards, and physical/chemical hazards.

Q. What types of precautionary statements may be included in the labeling section titled "Hazards to Humans?"

A. Acute effects precautions, delayed effects precautions, allergic effect precautions, and personal protective equipment requirements may be in the section of the labeling titled "Hazards to Humans."

Q. What is the meaning of the statement: "It is a violation of Federal law to use this product in a manner inconsistent with its labeling?"

A. It is illegal to use a pesticide in any way not permitted by the labeling. A pesticide may be used only on the plants, animals, or sites named in the directions for use. You may not use higher dosages, higher concentrations, or more frequent applications. You must follow all directions for use, including directions concerning safety, mixing, diluting, storage, and disposal. You must wear the specified personal protective equipment even though you may be risking only your own safety by not wearing it.

Q. Does the pesticide label contain all the instructions and directions for use that you need to use the product safely and legally?

A. Some pesticide products have all the necessary instructions and directions for use on the product label. For other products, more instructions and directions may be in other labeling that accompanies the product at the time of purchase. The label or labeling of still other products may refer to separate documents that contain specialized instructions and directions. Pesticide users are required by law to comply with all these types of instructions and directions -- not just with the label itself.

Q. What is a pesticide formulation?

A. A pesticide formulation is the mixture of active and inert (inactive) ingredients that form a pesticide product.

Q. What is the difference between active ingredients and inert ingredients?

A. Active ingredients are the chemicals in a pesticide product that control pests. Inert ingredients are the chemicals in a pesticide product that are added to make the product safer, more effective, easier to measure, mix, and apply, and more convenient to handle.

Q. What types of factors should you consider when you have a choice of formulations for a pest control task?

A. You should think about the characteristics of each formulation, and you should consider which of the formulation's advantages and disadvantages are important in your application situation. Also, consider the following: Do you have the right application equipment? Can you apply the formulation safely? Will the formulation reach the target and stay in place long enough to control the pest? Might the formulation harm the target site?

Q. If you had a choice of either a wettable powder formulation or a granular formulation for a particular pest control task, which would be best if drift were a major concern? Which would be best if you need the pesticide to stay on a surface that is not level, such as foliage?

A. The granular formulation would be the best choice in the first situation because granules have a much lower drift hazard than wettable powders. Granules do not stick to nonlevel surfaces, so

the wettable powder would be the best choice in the second situation.

Q. If you had a choice of either a wettable powder or an emulsifiable concentrate for a particular pest control task, which would be better if you were concerned about harming the treated surface? Which would be best if you were diluting with very hard or alkaline water?

A. The wettable powder would be the best choice in the first situation, because emulsifiable concentrates are corrosive and may cause pitting, discoloration, or other damage to treated surfaces. Wettable powders are difficult to mix in very hard or very alkaline water, so the emulsifiable concentrate formulation would be the best choice in the second situation.

Q. Why are adjuvants sometimes added to pesticide formulations?

A. Adjuvants are added to a pesticide formulation or tank mix to increase its effectiveness or safety.

Q. What type(s) of adjuvants should you consider for reducing drift? For coating a surface evenly? When you wish to combine two or more pesticides for one application?

A. Foaming agents and thickeners help reduce drift. Spreaders help coat the treated surface with an even layer of pesticide. Compatibility agents aid in combining pesticides effectively.

Q. What is the "environment?"

A. Environment is everything that surrounds us -- indoors and outdoors -- including natural elements, manmade objects, people, and other living organisms.

Q. Explain what is meant by point-source and non-point-source contamination of the environment by pesticides, and give an example of each.

A. Point-source pollution comes from a specific, identifiable place (point). A pesticide spill that moves into a storm sewer is an example of point-source pollution. Non-point-source pollution comes from a wide area. The movement of pesticides into streams after broadcast applications is an example of non-point-source pollution.

Q. Name some ways that careless pesticide handling could lead to point-source pollution.

A. Ways that careless pesticide handling could cause point-source pollution include, for example:

1. Mismanagement of wash water and spills produced at equipment cleanup sites.
2. Improper disposal of containers, water from rinsing containers, and excess pesticides.
3. Failure to correctly clean up leaks and spills at pesticide storage sites.
4. Spilling pesticides while mixing concentrates or loading pesticides into application equipment.

Q. What environmental factors should you consider any time you accidentally or intentionally release a pesticide into an environment?

A. Consider:

1. Whether there are sensitive areas in the environment at the pesticide use site that might be harmed by contact with the pesticide,

2. Whether there are sensitive offsite areas near the use site that might be harmed by contact with the pesticide,
3. Whether there are conditions in the immediate environment that might cause the pesticide to move offsite, and
4. Whether you can change any factors in your application or in the pesticide use site to reduce the risk of environmental contamination.

Q. What is a "sensitive area"? Give four examples of sensitive areas that you must be especially careful to protect when you are handling pesticides.

A. Sensitive areas are sites or living things in environments that are easily injured by a pesticide. Some examples of sensitive areas include: places where pesticides might get into ground water or surface water; homes, schools, playgrounds, hospitals, and other places where people are present; places where there are animals -- endangered species, bees, other wildlife, livestock, pets; places where crops, ornamental plants, or other sensitive plants are growing; and areas where food or feed is processed, stored, or served.

Q. List three routes by which pesticides can move offsite.

- A. 1. In air, through wind or through air currents generated by ventilation systems
2. In water, through runoff or leaching
3. On or in objects, plants, or animals (including humans) that move or are moved offsite.

Q. What factors influence whether a pesticide will move offsite in the air?

- A. 1. Droplet or particle size
2. Height and direction of release
3. Whether the pesticide tends to form vapors

Q. Name two circumstances that might cause a pesticide to move offsite in water.

- A. 1. Too much liquid pesticide is applied, leaked, or spilled onto a surface
2. Too much rainwater, irrigation water, or wash water gets onto a surface that contains pesticide residue

Q. Give some examples of ways that pesticides can move offsite on or in objects, plants, or animals.

- A. 1. Pesticides may be carried offsite if they stick to such things as shoes or clothing, animal fur, or blowing dust -- anything that moves from the use site to another location.
2. Pesticide residues may remain on treated surfaces, such as food or feed products, when they are taken from the use site to be sold.

Q. In addition to direct contact with the pesticide during application or through drift or runoff, how else may nontarget plants and animals be harmed by a pesticide?

A. Nontarget plants and animals may be harmed by pesticide residues that stay in the environment after the release. These can be residues in soil or on surfaces, or they may be residues that build up in the bodies of animals, harming those animals themselves and sometimes other animals that feed on them.

Q. What kinds of damage can some pesticides cause to surfaces?

A. Surfaces may become discolored, be pitted or marked, be corroded or obstructed, or be left with a visible deposit.

Q. Explain the terms hazard, toxicity, and exposure, and tell how they relate to one another.

A. Hazard is the risk of harmful effects from pesticides. Toxicity is a measure of the ability of a pesticide to cause harmful effects. Exposure is the total amount of pesticide that gets on or in the body.

$$\text{Hazard} = \text{Toxicity} \times \text{Exposure}$$

Q. What are the four routes through which pesticides can contact your body and cause you to be exposed?

- A. 1. Oral exposure (when you swallow a pesticide)
2. Inhalation exposure (when you inhale a pesticide)
3. Ocular exposure (when you get a pesticide in your eyes) and
4. Dermal exposure (when you get a pesticide on your skin).

Q. Which route of exposure should you, as a pesticide handler, be most concerned about?

A. Exposure to the skin is the most common route of exposure for pesticide handlers.

Q. What three factors determine how much pesticide will be absorbed through your skin and into your body?

A. The amount of pesticide that is absorbed through your skin (and eyes) and into your body depends on:

1. The pesticide itself and the material used to dilute the pesticide.
2. Which area of the body is exposed.
3. The condition of the skin that is exposed.

Q. Explain acute effects, delayed effects, and allergic effects.

A. Acute effects are illnesses or injuries that may appear immediately after exposure to a pesticide (usually within 24 hours). Delayed effects are illnesses or injuries that do not appear immediately (within 24 hours) after exposure to a pesticide or combination of pesticides. Allergic effects are harmful effects that some people develop in reaction to pesticides that do not cause the same reaction in most other people.

Q. How can you avoid harmful effects from pesticides?

A. Avoiding and reducing exposures to pesticides will reduce the harmful effects from pesticides. You can avoid exposures by using safety systems, such as closed systems and enclosed cabs, and you can reduce exposures by wearing appropriate personal protective equipment, washing exposed areas often, and keeping your personal protective equipment clean and in good operating condition.

Q. Name four signs or symptoms of pesticide poisoning and two signs or symptoms of irritation effects from pesticides.

A. Pesticide poisoning may cause nausea, vomiting, diarrhea, and/or stomach cramps; headache, dizziness, weakness, and/or confusion; excessive sweating, chills, and/or thirst; chest pains; difficult breathing; cramps in your muscles or aches all over your body. External irritants may cause redness, blisters, rash, and/or burns on skin, and swelling, a stinging sensation, and/or burns in eyes, nose, mouth, and throat.

Q. What is the first thing you should do when you or someone else is overexposed to pesticides?

A. The best first aid in pesticide emergencies is to stop the source of pesticide exposure as quickly as possible. If pesticide is on the skin or in the eyes, flood with water; if the pesticide has been swallowed, drink large amounts of water; if the pesticide has been inhaled, get to fresh air.

Q. What is heat stress?

A. Heat stress is the illness that occurs when your body is subjected to more heat than it can cope with.

Q. What are some common signs and symptoms of heat stress?

A. Heat stress may cause fatigue (exhaustion, muscle weakness); headache, nausea, and chills; dizziness and fainting; severe thirst and dry mouth; clammy skin or hot, dry skin; heavy sweating or complete lack of sweating; altered behavior (confusion, slurred speech, and quarrelsome or irrational behavior).

Q. If you are not sure whether a person is suffering from heat stress or pesticide poisoning, what should you do?

A. Because so many signs and symptoms could be from either heat stress or pesticide poisoning, do not waste time trying to diagnose the problem -- get medical help. In the meantime, get the person to a cooler place away from pesticides. Remove personal protective equipment or other clothing that could be contaminating the skin or making the person too warm, use water to clean and cool the skin, and give the person plenty of water to drink.

Q. What legal responsibility do you have for wearing the personal protective equipment that the pesticide labeling lists for your handling situation?

A. By law, you must wear at least the personal protective equipment listed on the labeling for the handling task you will be performing. You are allowed to wear additional or more protective personal protective equipment.

Q. Define the term "chemical resistant".

A. Chemical resistant: Able to prevent movement of the pesticide through the material during the period of use.

Q. How can you tell when a material is not chemical-resistant to the pesticide you are handling?

A. The material may change color, become soft or spongy, swell or bubble up, dissolve or become like jelly, crack or get holes, or become stiff or brittle.

Q. What factors determine how well your coverall will protect your body?

- A. 1. A coverall is most protective if it fits loosely so there is a layer of air between it and the skin or inner clothing.
2. A coverall is most protective if it is worn over another layer of clothing because each layer of clothing adds a protective layer of air as well as a layer of fabric.
3. Coveralls are most protective if they have tightly constructed seams and snug, overlapping closures that do not gap or come unfastened readily.

Q. When should you wear chemical-resistant gloves? Why are gloves so important to a pesticide handler?

- A. Wear chemical-resistant gloves any time you may get pesticides on your hands, except for some fumigants whose labeling may direct you to not wear gloves. The hands are by far the most likely route of exposure for a pesticide handler.

Q. If you need to remove your gloves during pesticide handling, what steps should you take to remove them and put them back on?

- A. 1. Wash gloves thoroughly before taking them off.
2. Wash hands thoroughly and dry them before putting the gloves on again.

Q. Why do pesticides sometimes get on your skin even when you are wearing gloves and protective footwear?

- A. The items may not be chemical-resistant to the pesticide being handled; they may not be worn correctly; they may not be in good condition; or they may not have been cleaned correctly or replaced soon enough.

Q. When should you wear protective headgear? What type of headgear should you use?

- A. Whenever you may be exposed to pesticides from above, wear protective headgear to help keep pesticides off your head, neck, eyes, mouth, and face. Wear a chemical-resistant hood or wide-brimmed hat. Plastic "safari" hats with plastic sweatbands are a good choice.

Q. When the pesticide labeling calls for "protective eyewear," what should you wear?

- A. Wear goggles, a face shield, or safety glasses with brow and side shields.

Q. What are the differences among dust/mist-filtering respirators, vapor-removing respirators, and air-supplying respirators?

- A. Dust/mist-filtering respirators are masks or cartridges that filter dust, mists, and particles out of the air around you. Vapor-removing respirators use a cartridge or canister to remove pesticide gases and vapors from the air around you. Air-supplying respirators provide you with clean air either from an air tank or from a location where the air is not contaminated with pesticides.

Q. What special hazards do fumigants pose for pesticide handlers?

- A. Fumigants pose a serious inhalation hazard to pesticide handlers. Some fumigants also can cause severe skin burns if they are trapped next to the skin by tight clothing or chemical-resistant personal protective equipment.

Q- If the chemical-resistant gloves you have selected are reusable, how often should you routinely replace them? Under what conditions should you replace chemical-resistant items immediately?

A. Throw out most reusable gloves that have been worn for about five to seven work days. Extra-heavy-duty gloves, such as those made of butyl or nitrile rubber, may last 10 to 14 days. Replace chemical-resistant items immediately if they show any sign of wear or have holes, tears, or leaks.

Q- What should you do with a coverall that has highly toxic pesticide concentrate spilled on it?

A. Dispose of the coverall. It cannot be adequately cleaned.

Q- What should you tell the people who will be laundering your clothing about how to protect themselves from pesticides?

A. Tell them to:

1. Wear chemical-resistant gloves and apron, especially if handling contaminated items regularly or handling items contaminated with highly toxic pesticides.
2. Work in a well-ventilated area and do not inhale steam from the washer and dryer.

Q- What should you do with your respirator between handling tasks?

A. Seal the respirator in a clean, airtight container, such as a sturdy zip-close plastic bag. If possible, put caps over the opening on the cartridges or canisters.

Q- What should you do when you are finished using your respirator for the day?

- A. 1. Discard any masks, filters, or respirators that cannot be reused.
2. Take off the prefilters and cartridges or canisters. Discard them or, if still usable, replace their caps and seal them in an airtight container, such as a zip-close plastic bag.
3. Wash the respirator body, face piece, and any reusable filters. Soak them for at least 2 minutes in a mixture of 2 tablespoons of chlorine bleach in a gallon of hot water. Rinse thoroughly. Dry thoroughly or hang them in a clean area to dry.
4. Store the respirator and any reusable cartridges, canisters, filters, and prefilters in an airtight container in an area where they are protected from dust, sunlight, extreme temperatures, excessive moisture, and pesticides or other chemicals.

Q- How will you know when to replace dust/mist masks, prefilters, and dust/mist-filtering and vapor-removing canisters and cartridges?

- A. 1. Change dust/mist masks, cartridges, and prefilters immediately if you have trouble breathing. They usually need to be changed at least every eight hours.
2. Change vapor-removing canisters or cartridges immediately if you smell, taste, or feel irritation from pesticide vapors. Change them whenever any "service life indicator" tells you that you should, or after the time limit set by the manufacturer. Otherwise, replace them after about eight hours of use.

Q- What eight basic safety questions should you ask yourself whenever you or those you supervise will be using pesticides?

- A. 1. Have I read the labeling?
2. How can I avoid exposure to pesticides?
3. What personal protective equipment is needed?
4. Is the equipment ready and safe?
5. Am I avoiding the accidental spread of pesticides?
6. Have I instructed the handlers I supervise?
7. Am I prepared for emergencies?
8. Are people and animals out of the area?

Q- List some consequences of the incorrect use of pesticides.

- A. 1. Incorrect use can result in wasted material, failure to control the pest, and damage to the target site.
2. Misused pesticides can cause immediate as well as long-term harmful effects to humans, to other living things, to property, and to other parts of the environment.
3. Misused pesticides can result in fines as well as legal actions charging you with liability for damages.
4. Pesticides are expensive. Using them incorrectly can be costly.

Q- Name at least four factors to consider when choosing among different formulations.

- A. 1. Whether the formulation will cause unwanted harm to plants, animals, or surfaces in the application site.
2. The application equipment available, and whether it's best suited for the job.
3. Hazard of drift or runoff (likelihood of air currents or excess water).
4. Risk to applicator, workers, and other people and animals likely to be exposed.
5. Habits or pests growth patterns.
6. Surface to which the pesticide is to be applied.
7. Cost.

Q- Name four conditions at the application site that may influence some of the decisions you make about the application.

- A. Type of space or surface to be treated; surface cleanliness; surface moisture; temperature; humidity; presence of direct sunlight; possibility of rain or watering; air movement.

Q- Name some factors to consider when making an application near electricity or pilot lights.

- A. If the daytime temperature rises above 100 degrees Fahrenheit, you may not do any oil-based fogging while the pilot lights are on. Turn pilot lights off when using any type of 'bug-bomb'. The spark that is created by the bug-bomb may ignite the gas and cause an explosion. When applying space sprays, you must consider any electrical sparks. Again, the spark may react with the pressurized contents of the spray and cause an explosion.

Q- If heat stress is a concern, what five factors need to be adjusted?

- A. Heat factors, workload, personal protective equipment, amount of water consumed, and the work schedule.

Q- What two precautions should you take to avoid getting pesticides into your water source at a mix-load site?

A. 1. Keep the water pipe or hose well above the level of the pesticide mixture, and use a device to prevent back-siphoning, if necessary.

2. Avoid mixing or loading pesticides in areas where a spill, leak, or overflow could allow pesticides to get into water systems.

Q- What four types of personal protection, beyond what you need during application, should you consider wearing while mixing or loading pesticides?

A. Front protection, face protection, protection from dusts, and protection from vapors.

Q- What should you do with an empty pesticide container?

A. 1. If containers are rinsable, rinse them as soon as they are empty.

2. Return all empty pesticide containers to the pesticide storage area or the container holding area when you finish your task.

3. Crush, break, or puncture empty containers that cannot be refilled, reconditioned, recycled, or returned to the manufacturer.

4. Dispose of containers in accordance with labeling directions and with any laws or regulations that apply.

Q- What types of empty pesticide containers can be rinsed?

A. 1. Glass, metal, and plastic containers

2. Plastic-lined paper or cardboard containers

3. Unlined paper or cardboard containers that can withstand the rinsing process.

Q- What two methods of rinsing can you use?

A. Triple rinsing and pressure rinsing.

Q- What are three ways to help you decide whether you can safely mix two pesticides together for application?

A. 1. Check the pesticide labeling. It may list the pesticides (and other chemicals) known to be compatible with the formulation.

2. Get a compatibility chart, which is available from several sources.

3. Test a small amount of the mixture before mixing large quantities of the pesticides together.

Q- Name four types of pesticide application that might require more personal protective equipment than that specified on the pesticide labeling.

A. 1. Hand-carrying application equipment.

2. Entering the path of the released pesticide.

3. Walking into a just-treated area.

4. Using high-exposure application methods where the pesticide may engulf you.

5. Applying pesticides in enclosed spaces.

6. Adjusting pesticide application equipment.

7. Immersing hands and forearms in pesticides.

8. Applying into or across air currents.
9. Applying concentrated pesticides.

Q- What safety procedures should you follow each time you apply a pesticide?

- A. 1. Deliver the pesticide to the target site.
2. Check the delivery rate.
3. Check for appearance.
4. Avoid nontarget organisms.
5. Avoid nontarget surfaces.
6. Operate equipment safely.

Q- When you are finished with a mixing, loading, or application task, what should you do right away?

- A. 1. Wash your pesticide equipment and then wash yourself.
2. Return equipment to its designated place.
3. Safely store or dispose of all pesticide materials and other chemicals that you have used.
4. Be sure that your work site presents no hazards to people or to the environment.
5. Record what you have applied and the conditions at the application site.

Q- What should you do with rinsate that you create when you clean your pesticide equipment?

- A. Collect the rinsate. Reuse it, if possible, or dispose of it as excess pesticide.

Q- When you are finished with pesticide handling tasks, what steps should you take for personal cleanup?

A. Wash the outside of your gloves before taking them off. Then carefully peel back your personal protective equipment to avoid getting pesticides on your skin. Remove any other clothing that has pesticide on it. If you cannot take a shower right away, use a mild liquid detergent and warm water to wash your face, hands, forearms, and any other area that may have pesticides on it. As soon as you can -- no later than the end of the work day -- wash your whole body and hair thoroughly with a mild liquid detergent and plenty of warm water.

Q- Why should you keep records of pesticide applications?

- A. 1. Records can establish proof of proper use.
2. Good records can save you money by improving your pest-control practices and your efficiency.
3. Records can help you reduce pesticide mistakes or misuse.
4. Good records can help you reduce carryover by showing exactly how much was needed last time.

Q- What are closed mixing and loading systems?

A. Systems designed to prevent pesticide from contacting handlers or other persons during mixing and loading.

Q- What are enclosed application systems?

A. An enclosure, such as a cab or cockpit, that surrounds the occupants and prevents them from contacting pesticides outside of the enclosure.

Q- When should you consider installing a pesticide containment systems?

A. If you often mix and load pesticides in one place, or if you often clean equipment at one location.

Q- What are the advantages of pesticide containment systems?

A. They can save time and money. They make spill cleanup easier, and they reduce pesticide waste by allowing reuse of rinse water and spill cleanup water. They also help prevent the harm that spills and runoff can cause to the environment or to people.

To triple rinse a container:

1. Empty the container into the tank. Let it drain an extra 30 seconds.
2. Fill the empty container 10-20 percent full of water.
3. Replace the closure and rotate the container for about 30 seconds. Invert the container so the rinse reaches all the inside surfaces.
4. Drain the rinse water from the container into the tank. Let the container drain for 30 seconds.
5. Repeat steps 2 through 4 two more times for a total of three rinses.

Q- What precautions should you take when you transport pesticides in a vehicle?

- A.
1. Never carry pesticides in the passenger section.
 2. Never allow children, other passengers, and pets to ride with pesticides.
 3. Never transport pesticides with food, clothing, or other things meant to be eaten or in contact with people or animals.
 4. Never leave your vehicle unattended when transporting pesticides in an unlocked trunk compartment or open-bed truck.
 5. Consider transporting highly volatile pesticides in separate trips from other chemicals.

Q- What steps should you take to protect pesticide containers during transport?

- A.
1. Transport containers with intact, undamaged, and readable labels.
 2. Inspect containers to be sure that all openings are tightly closed and that there are no pesticides on the outside of the containers.
 3. Handle containers carefully.
 4. Anchor all containers securely.
 5. Protect paper and cardboard containers from moisture.
 6. Protect pesticides from extreme temperatures.

Q- List four actions that you should take to establish a safe storage site.

A. Keep unauthorized people out; prevent water damage; control the temperature; provide adequate lighting; use nonporous materials; prevent runoff; provide clean water.

Q- List four actions to maintain a safe storage site.

A. Prevent contamination; keep labels legible; keep containers closed; use original containers; watch for damage; store volatile products separately; isolate waste products; know your inventory;

consider shelf life.

Q- When a pesticide container is damaged, what can you do?

- A. 1. Use the pesticide immediately at a site and rate allowed by the labeling.
2. Transfer the pesticide into another pesticide container that originally held the same pesticide and has the same label still intact.
3. Transfer the contents to a sturdy container that can be tightly closed and fasten the label to the outside of the new container.
4. Place the entire damaged container and its contents into a suitable larger container.

Q- If you have excess pesticide materials that are still usable, what can you do with them?

- A. Apply them to a site listed on the labeling; find someone else who can legally use them; return them to the dealer, formulator, or manufacturer.

Q- If you have pesticide wastes (other than empty containers) what can you do with them?

- A. Dispose in a hazardous waste landfill or pesticide incinerator, or store until disposal is possible.

Q- List three ways to avoid the need for disposing of empty pesticide containers as wastes.

- A. Use refillable containers; recycle or recondition the containers; use soluble packaging.

Q- What do the three C's of spill management stand for?

- A. Control, Contain, Clean up.

Q- What should you do to control a spill situation?

- A. Protect yourself; stop the source of the spill; protect others; stay at the site.

Q- How should you contain a spill?

- A. Confine the spill; protect water sources; absorb liquids; cover dry materials.

Q- What should cleanup include?

- A. Clean up the spill; decontaminate the spill site; neutralize the spill site, if necessary; decontaminate equipment; decontaminate yourself.

Q- Who can you call when you need help to manage a spill?

- A. Chemtrec; emergency numbers on pesticide labeling; police department or highway patrol; fire department; public health department.

Q- When should you have a spill kit on hand?

- A. Every time a pesticide or pesticide container is handled.

Q- Why is it so important to apply the correct amount of pesticide to the target site?

- A. If you apply too little pesticide, you may not fully control the pest. Overdosing may cause damage or injuries, leave illegal residues, and cause you to be fined or be liable for damages.

Q- Where can you find out how much pesticide to apply?

A. From the Directions for Use section of the pesticide labeling, and from other sources, such as consultants, industry organizations, pest or pesticide specialists, Cooperative Extension educators, university specialists, or pesticide dealers.

Q- What are some ways that application rates may be stated?

A. 1. Amount of formulation per unit of area or per unit of volume, such as pounds or gallons per acre, per square feet, or per cubic feet.

2. Amount of formulation per volume of mixture, such as 3 tablespoons of product per 5 gallons of kerosene or 1 pint of product per 100 gallons of water.

3. Amount of active ingredient per unit of area or per volume of mixture, such as 1 pint active ingredient per 1,000 square feet, or $\frac{1}{2}$ pound active ingredient per 500 gallons of water.

4. Percentage of the final dilution, such as $\frac{1}{2}$ percent by volume or 1 percent by weight.

Q- Why is it important to calibrate some types of pesticide application equipment?

A. Many types of pesticide application equipment must be calibrated so that the correct amount of pesticide will be released to the target site.

Q- How do you calculate the application rate?

A. The amount of pesticide dispersed, divided by the distance covered, is the application rate.

Q- Why should you recheck equipment calibration frequently?

A. Clogging, corrosion, and wear may change the delivery rate, or the settings may gradually get out of adjustment.

Q- What pesticide formulations must be diluted before application?

A. You must dilute all formulations except those that are sold as ready-to-use products or those designed to be applied full strength.

Q- What information do you need to get from the pesticide labeling or other sources before you can dilute pesticides correctly?

A. Read the pesticide labeling or consult recommendations from other sources to find out what to use to dilute the formulation; how much to dilute the formulation; and how much of the dilute pesticide to apply per unit of area.

Q- What information do you need to know about your own situation before you can calculate how much pesticide and diluent to combine to achieve the correct amount of dilute pesticide mixture in your application equipment?

A. You must know how much your equipment holds when full or how much mixture you will need to complete the job; how much mixture your equipment applies per unit of area; and the size of the site you need to treat.

DISCLAIMER

YOU ARE WELCOME TO USE THIS STUDY GUIDE, WHICH IS EXPRESSLY MEANT TO ASSIST YOU WITH THE STRUCTURAL APPLICATOR EXAM PREPARATION.

SINCE LAWS & REGULATIONS ARE PERIODICALLY UPDATED, THERE IS NO SUBSTITUTE FOR REGULARLY REVIEWING THE LAWS & REGULATIONS THAT GOVERN PESTICIDE USE.

IF YOU HAVE QUESTIONS, CONTACT YOUR LOCAL AGRICULTURAL COMMISSIONER

